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FIRST
ANNUAL REPORT

OF THE

BOARD OF HEALTH

OF

DETROIT.

JULY, 1882.

DETROIT:
POST & TRIBUNE JOB CO., CITY PRINTERS.
1882.

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O. W. WIGHT, A. M., M. D.,

ATTORNEY AND COUNSELLOR-AT-LAW,

Health Officer, Detroit, Mich.

FIRST

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Members of the Health Department.

BOARD OF HEALTH.

EX-OFFICIO.

HON. WM. G. THOMPSON, Mayor.
HON. H. P. BRIDGE, Controller.
HON. H. M. DEAN, Pres't of the Met. Police Com'rs.

APPOINTED.

D. O. FARRAND, M. D.
MORSE STEWART, M. D.
JOHN FLINTERMANN, M. D.

HEALTH OFFICER.

O. W. WIGHT, A. M., M. D.

CLERKS.

E. W. TALLMADGE.
A. F. SCHULTE.

CITY PHYSICIANS.

FERDINAND KUHN, M. D.
EDWARD J. McPHARLIN, M. D.
CHARLES P. FRANK, M. D.

SANITARY POLICE.

JOSEPH BURGER, Sergeant in charge.
AMOS S. LANE, Meat Inspector.
FRANK BLUM, Assistant Meat Inspector.

WM. BANNISTER,
NOAH CHARBONEAU,
JAMES CANFIELD,
JOHN JANTZ,
DANIEL KAVANAUGH,
PATRICK MURNANE,
THOMAS J. MYLER,
EMERY A. NOBLE,
EDWARD S. SILSBEE.
THOMAS THOMPSON.

Detailed to make sanitary inspections, to serve papers and to placard houses for infectious diseases.

26708

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OFFICE OF THE BOARD OF HEALTH,
DETROIT, June 1st, 1882.

TO THE HONORABLE THE COMMON COUNCIL:

GENTLEMEN—In accordance with the provisions of section 5, of an act entitled "An Act for the Establishment of a Board of Health for the City of Detroit," approved May 6, 1881, the Board of Health herewith transmits to your honorable body the first annual report of the Department, and respectfully calls your attention to the present and future sanitary needs of the City, as herein set forth.

Respectfully submitted,

D. O. FARRAND, M. D.,
President of the Board of Health.

REPORT OF THE HEALTH OFFICER.

OFFICE OF THE BOARD OF HEALTH,
DETROIT, July 1, 1882.

TO THE HONORABLE THE BOARD OF HEALTH:

GENTLEMEN—As the Board is required by law to make a full report to the legislative branch of the municipal government on the first day of July of each year, I have prepared, in obedience to your order, and herewith have the honor to present to you a full account of all the transactions and expenditures of the Board, from its organization last year, up to the first of June this year, together with extensive discussions of various sanitary problems encountered, and to be encountered, in our work, with such recommendations as seem to me needful, and with exact mortuary statistics for the half year beginning December 1, 1881, and ending the last day of May, 1882. It was an impossibility to prepare the statistics of the Department up to July 1, the very day on which the Board is required to make its report. Henceforth the regular sanitary year will begin on the first day of June, unless a change should be made in the law.

My report has been written in the midst of the toilsome duties of administrative work, in less than thirty consecutive days. It might have been better if more time could have been devoted to its preparation. It is a frank, earnest discourse to citizens on subjects of sanitary importance at home, rather than a scientific discussion of hygienic questions addressed to the learned. "No sanitary improvement," said a prime minister of England, Lord Derby, "worth the name, will be effective, whatever acts you pass, or whatever powers you confer upon public officers, unless you can create an intelligent interest in the matter among the people at large. The State may issue directions, municipal authorities may execute to the best of their power, inspectors may travel about, medical authorities

the death-rate of the city are exhibited with as much clearness as possible. The ordinances of the city and laws of the State authorizing and requiring the Board to undertake such important public work are sufficiently cited.

There follows a chapter on the management of contagious and infectious diseases in Detroit, as projected and successfully carried out by the Board of Health. All the details of this large undertaking are given in due sequence, in order to explain to the Council and citizens the aim and scope of the important and difficult work. One of the great objects of establishing a public sanitary authority is to combat the infectious diseases. The legal authority for the procedure is pointed out and the results are estimated with fairness, at least with the intention of fairness. It is a subject for congratulation that Detroit already stands foremost, among the important cities of the world, in an effectively administered method of restricting the spread of those maladies that are communicable from person to person, and sometimes sweep off large sections of the population, especially of the younger portion of the population, when left uncontroled.

There naturally follows a chapter on the preventive management of small-pox. It contains a sanitary history of every case occurring in this city from the first of October, 1881, to the middle of June, 1882. The history closes with the time when that part of the report went to press. Since then there have been two new cases, both taken to the pest-house. There are now (July 1st) only three convalescent cases in the hospital; otherwise the city is free from the loathsome disease. The same chapter contains a sufficiently extended discussion of the important question of vaccination. Very instructive is the fact that about a dozen well persons entered the pest-house to take charge of afflicted members of their families and all escaped unscathed. The history clearly demonstrates the utility of early isolation and thorough disinfection, as well as of vaccination, in preventing the spread of small-pox. In the same connection is repeated an earnest discussion of the question of providing a safe hospital for the care of homeless small-pox patients. The existing pest-house is only a make-shift: It may become injurious to large property interests in that part of the city, and should not be continued there longer than is necessary. Provision for the future must be made without delay. While the city can most economically hire hospital accommodations for patients committed to its care laboring under ordinary diseases, it must have a small-pox hospital of its own. The question of its location should be discussed temperately, candidly, unselfishly, and with a becoming spirit of conciliation. The sooner the Common Council looks the necessity in the face the better. The diffusion of small-pox throughout the city for a single season would damage its business interests more than the cost of fifty hospitals.

The sewerage and house-drainage system of Detroit has been discussed at considerable length, as the sanitary importance of the subject demands. The defects of existing sewers are pointed out, and discrimination is made between the evils of a system in general use and the faults of construction. My convictions are very strong in favor of separate systems—one for storm-water and land-water drainage, another for sewage only. Detroit is the best adapted to the separate system of any large city in the world. The great river will take care of all the sewage that can be run into it, without causing nuisance. Most other cities, in order to get safely rid of sewage, must make large expenditures for pumping works, for sewage-farms properly prepared for irrigation or downward intermittent filtration, and for a system of iron pipes between the pumping works and the farms. Such engineering appliances are not here needed. Nothing more is required than a system of small vitrified pipes, properly laid, for conveying directly to the river all the sewage of the city, which is exactly the water-supply after it has passed through houses and factories and has become polluted with the organic wastes of domestic and industrial life. The old sewers, when cleaned out, will be excellent for conveying away great volumes of water falling from the clouds and springing from the earth. In the same connection is discussed the necessity of a better and safer system of house-drainage. An ordinance is proposed for the purpose of placing this vital sanitary matter under skilled public supervision.

The question of slaughtering in the city has been discussed at considerable length. Therewith are printed the reports of Mr. Lane, the Meat Inspector, giving the location, condition and ownership of every slaughter-house in Detroit. The list is a formidable one, and shows the extent to which the sanitary evil exists. An effort has been made to point out a remedy without injury to vested interests. A tentative legislative bill has been drawn, to organize the butchers of Detroit into an abattoir company, so that they may carry on their business of slaughtering outside of the city with increased profit to themselves and with great relief to citizens. Provision is therein made for proper and needed inspection of all animals slaughtered for supplying the meat markets of the city. Various "offensive trades," connected with or growing out of slaughtering, would naturally follow a public abattoir, and thus would a multitudinous nuisance be abated, to the increase of comfort and the enhanced value of property in many parts of the town.

The administrative method adopted by the Health Department for the abatement of nuisances needs no special explanation. Forms of blanks are given, so far as may be necessary to make the working of the method clear. Ordinances now in force on this subject are reproduced in such sequence as to render their applications distinct and easily comprehensible.

The ice-supply of Detroit is sufficiently considered to show that the popular notion that water is completely purified by freezing is a dangerous delusion. Chemistry demonstrates that a large percentage of the impurites in polluted water remain in the ice after freezing. There can be little doubt that many of the complaints made against the drinking water of Detroit have their origin in observations of foulness that comes from the impure ice with which it is cooled. In due time the Board of Health will issue an order prohibiting within the limits of Detroit the sale of any ice for use in contact with food and drink which has been cut on water that is not pure enough for a public supply. Dealers will do well to bear this in mind and make timely preparations for harvesting only a clean crop the coming winter.

The milk supply of the city has received sufficient attention to lay the foundation for a proposed measure to secure the people against adulteration and unwholesomeness. Pure milk can be obtained only from healthy cows. It is therefore necessary to provide for skilled inspection of dairies from which the supply comes. It is further necessary to provide against the infection of milk by persons handling it. That infectious diseases are scattered by dairymen is no longer doubted. To enact that all milk must be pure, is about as efficacious as the proposed measure of a rural member of the Legislature to cure all evil in the State by a law requiring everybody to be virtuous. The elaborate ordinance presented for consideration is designed to place the milk-supply, from its sources to the tables of consumers, under the supervision of the public sanitary agency. State legislation will be first required, in order to authorize the Council to pass such an ordinance.

Only the Police Department and the Health Department, to which complaints of citizens in distress are constantly made, understand the extent of the smoke nuisance. In a hundred places, manufacturers burn soft coal, some of them, "slack," or the dirty refuse of coal, producing great clouds of choking and begriming smoke, injurious to health and destructive to property. There is no law against such an injurious practice. Consumers of smoke have been invented and work successfully. It imposes no hardship to require the use of such appliances to abate the smoke nuisance. The subject has been briefly considered in this report, and an ordinance has been drawn, founded on an ordinance that has been found to work well in Cincinnati, to relieve the people from this evil. The subject is earnestly commended to the attention of the legislative branch of the municipal government.

As the Glucose factory has given rise to a conflict of opinions and interests in its neighborhood, some space has been devoted in this report to trace and exactly define its relations to the Board of Health. Naturally enough, some of the interested parties have deprecated any interference at all, on the part of the Board, with what they are pleased to call a legitimate manufacturing business. Others have blamed the Board for not abating, in a summary way, what seemed to them an unmitigated nuisance. Standing between two fires, the Board has been obliged to act in a disinterested manner, with justice to all concerned, and in conformity to the authority with which it has been invested. I have reviewed the whole matter, with sufficient fullness of details, with ample narrative of facts, and with intention of perfect fairness.

The water-supply of Detroit has been made a vexed question. I have discussed the subject sufficiently to give a complete history of a very recent analysis of the Detroit water, made in the laboratory of the State University by Prof. A. B. Prescott and Mr. T. J. Wrampelmeier. There is no question about the competency of the analysts, and the results of their careful determinations may be regarded as conclusive. The minute directions for taking samples of the water, as well as the instructions to the chemists, are printed in the discussion, so that no fact in the history of the analysis may be left unrecorded. That chapter of my report will have a fresh interest for the people of Detroit. As Dr. Parkes says, "In all sanitary investigations, the question of the water-supply is one of the first points of inquiry, and of late years quite unexpected evidence has been obtained of the frequency with which diseases are introduced by the agency of water." The impressions of the Health Officer, from a general knowledge of the source of the water-supply of this city, have been fully borne out by the analysis.

The expenses of the Health Department are given in chronological detail. The economy of the Board, considering the amount of work done, is a striking feature of the sanitary administration. The cost per capita in Detroit is less than that of any other large city in this country. In Chicago, the expenditure for the Health Department is about $120,000 a year, which is equivalent to $30,000 a year for Detroit. Here, only $8,000 per annum are required. In New York, 120 employés in the Health Department receive $146,198 per annum, besides 26 others who get from $40 to $100 per month. Here, the aggregate salaries of the office are a trifle over $5,000.

The tables of mortuary and meteorological statistics are meager enough and embrace a period of only half a year. Of course exact generalizations can not be made from such narrow data. The death rate for the six months is a little over 21 in the thousand per annum. As no unusual amount of sickness and mortality has prevailed, the death rate may be taken as approximately showing the sanitary condition of the city. It is far from being among the worst; in fact, is among the best; yet, considering the natural advantages of Detroit, it is not quite satisfactory. It should be, and may be, reduced to 15 or 16 in the thousand. Sanitary improvements, conscientiously carried out, will add twenty-five per cent. to the value of life in our fair city. The subject is more fully discussed in the introduction to the tables.

Other large questions, such as the hygiene of schools, the paving and cleaning of streets, the adulteration of food, the ventilation of public buildings, etc., have not been discussed, but in due time will receive attention. Everything cannot be done at once. The complete sanitation of a large city is a vast undertaking, and cannot be achieved without prolonged effort. And, when achieved, public sanitation, like public liberty, can only be maintained at the cost of perpetual vigilance. Legislators, as well as people, have to learn its material as well as its higher value. As Dr. John S. Butler nobly says: "In fairly estimating what sanitary science has done and can do for the people, we are to take into consideration all those powers, values, and, indeed, sympathies, which are the real vital elements of the State, and which must exist in due proportion to make the best whole. We are also to take the right estimate of another element of public or State property, whose full measure of worth political economists have only of late been ready to admit, the money value of each healthy life, acknowledging the soundness of that axiom of finance as well as of political economy, that public health is public wealth."

LAWS ON WHICH IS BASED THE HEALTH DEPARTMENT OF THE CITY OF DETROIT.

"*The Public Health, the Welfare and Safety of the Community, are Matters of Paramount Importance, to which all the Pursuits, Occupations, and Employments of Individuals, Inconsistent with their Preservation, must yield.*"—COMMONWEALTH VS. UPTON, 6 GRAY, 473, OPINION BY MERRICK, J.

LAWS CREATING HEALTH DEPARTMENT.

The fundamental law creating the present Health Department of the City of Detroit, is the following

ACT,

To provide for the establishment of a Board of Health for the City of Detroit.

SECTION 1. *The People of the State of Michigan enact*, That there shall be appointed by the Common Council of the City of Detroit, on the nomination of the Mayor, on the third Tuesday of June, 1881, three persons, electors and practicing Physicians of said city, who shall be and constitute, together with the Mayor, Controller and President of the Metropolitan Police Commissioners of said city, a Board of officers of said city, to be known and designated as the "Detroit Board of Health." The Mayor, the Controller and the President of the Metropolitan Police Commissioners shall be ex-officio members of the said Board of Health. The three Physicians first appointed shall hold their offices for the terms of one, two and three years, respectively, from July first, eighteen hundred and eighty-one, and annually, after the year eighteen hundred and eighty-one, on the third Tuesday of June a member of said Board, with like qualifications, shall be appointed, on the nomination of the Mayor, for the term of three years. Vacancies in said Board shall be filled in the same manner that appointments are made as herein provided for. The Board of Health thus constituted for the purposes of organization and management of its department, shall have all the authority of other Boards in said city and ordinarily pertaining to such bodies, and also to appoint a Secretary as an executive officer, who shall be known as the Health Officer of said city. The Health Officer shall be selected with special reference to his knowledge of chemistry, hygiene and sanitary matters, and shall devote his whole time to the sanitary condition of the city and other duties as prescribed or required by said Board. Said Health Officer may be removed from office by the Board of Health, two-thirds of the members thereof voting for such removal.

SEC. 2. The members of the said Board of Health shall serve without compensation, but the Health Officer shall receive an annual salary not exceeding three thousand dollars, ($3,000) as may be determined by the Common Council of said city.

SEC. 3. The said Board, on or before the first day of March of each year, shall report to the Controller, to be by him transmitted as other estimates to the Common Council, an estimate of the amount of money necessary to defray the expenses of said Board in preserving the health of said city during the ensuing fiscal year. The Common Council shall have the power to raise by taxation the amount so estimated, or any such part thereof as may be approved each year, in the same manner as other general taxes are levied and collected. The Common Council shall also have full power to pass and enforce all needful ordinances for the regulation of the sanitary condition and preservation of the said city.

SEC. 4. The City Physicians of said city shall be appointed by the Common Council, on the nomination of the said Board of Health, on the third Tuesday of June, after the year eighteen hundred and eighty-one, and shall in all matters of public health and sanitation, co-operate with and be subject to said Board of Health.

SEC. 5. On the first day of July in each year, and at other times when required by the Common Council, the said Board shall present to the said Council a report of their operations during the year, with such information and recommendations as may be deemed important and necessary.

SEC. 6. From and after the second Tuesday of January, eighteen hundred and eighty-two, all power herein delegated to the Common Council, relative to the confirmation of members of said Board, shall be exercised by the City Council of said city.

Ordered to take immediate effect.

Approved May 26, 1881.

ORGANIZATION OF THE BOARD.

In accordance with the requirements of the act above cited, the Hon. Wm. G. Thompson, Mayor of the city, sent to the Common Council for its approval, June 1, 1881, the following nominations to membership in the Board of Health, to wit :— Dr. D. O. Farrand, Dr. John Flintermann, and Dr. Morse Stewart, for the terms of one, two, and three years respectively. The Mayor, Hon. Wm. G. Thompson, the Controller, Hon. H. P. Bridge, and the president of the Metropolitan Police Commissioners, Hon. Horace M. Dean, were ex-officio members of the Board under the law.

The first meeting of the Board was held in the Mayor's office, July 14, 1881. The Board was organized by the election of Dr. D. O. Farrand as President, and the appointment of Mr. E. S. Sherill as temporary Secretary. A motion of Dr. Stewart, to appoint a committee "to acquire all the information possible relating to the constitution of the Board from the various acts of the State Legislature, and the Common Council of the city, including the Charter regulations appertaining thereto," unanimously prevailed, and the President appointed as such committee, Dr. Morse Stewart, Dr. John Flintermann and Controller H. P. Bridge. It does not appear from the minutes of the Board that the committee ever made a formal report. The information sought through the committee will be found in different sections of this report, in convenient form for preservation and consultation.

In due time the Common Council matured and passed the following :

ORDINANCE CONCERNING THE DUTIES OF THE BOARD OF HEALTH OF THE CITY OF DETROIT, AND PROVIDING FOR THE MAINTENANCE OF THE PUBLIC HEALTH.

It is hereby ordained by the People of the City of Detroit:

SECTION. 1. The Board of Health shall have power, and it is hereby made their duty:

1. To make diligent enquiry with respect to all nuisances, of every description, in said city, which are, or may be, injurious to the public health, and abate the same;

2. To stop, detain and examine, every person coming from a place infected with pestilential or infectious disease, in order to prevent the introduction of the same into this city;

3. To cause any person, not a resident of this city, who is infected with any infectious or pestilential disease, to be sent back to the place from whence he or she came, or to the pest-house or hospital;

4. To cause any person, a resident of this city, who is infected with any pestilential or infectious disease, to be removed to the pest house or hospital, if, in their opinion the removal of such person is necessary for the preservation of the public health, and can be effected with safety to the patient;

5. To destroy or disinfect as, in their judgment, may be deemed proper, any furniture, wearing apparel, goods, wares, or merchandise, or articles or property of any kind, which shall be exposed to, or infected with a contagious or infectious disease: Provided, however, that such property shall be appraised by two disinterested persons, in order that remuneration may be made therefor by the Common Council;

6. To rent proper houses to be used for pest-houses and hospitals, of which they shall have control and direction, and to employ such nurses, officers, agents, servants or assistants, and provide the necessary furniture, medicines, articles and necessaries for the use of the pest-houses or hospitals, and the persons

therein confined, as may be deemed necessary, and when so authorized by the Common Council;

7. To require the occupant of any dwelling-house, store, shop or other building in which there shall be any person sick with small-pox, varioloid or other infectious disease, to put up and maintain in a conspicuous place on the front of said dwelling house, store, shop or other building, a card or sign, to be furnished by the Board, on which shall be written or printed, in large letters, the words, "small-pox," or name of such infectious disease; and in case of the neglect or refusal of any person to comply with such requirement, to remove the patient to the pest-house or hospital;

8. To make and enforce any necessary order compelling any steamboat, or other vessel or craft, having on board any infected or diseased person or property, not to enter the harbor or remove therefrom;

9. To exercise a general supervision over the health of the city, and to make, from time to time, such recommendations to the Common Council as they deem proper, to promote the cleanliness and salubrity of the city;

10. The said Board shall annually and oftener, if they deem it necessary, divide the city into health districts;

11. The said Board shall provide and keep on hand a supply of cards, marked "small-pox," to be put upon any house in which there is a person sick of that disease or the varioloid; and such cards, upon application, shall be furnished without charge;

12. Whenever, in their judgment, it shall be necessary for the public health, the said Board may at once take possession of any building, factory, hotel, dwelling-house, out-house, premises or grounds upon which, in their judgment, there exists any nuisance prejudicial to the public health; and if the owner or occupant shall refuse or neglect to forthwith abate such nuisance in the manner directed by said Board, said Board may cause the same to be abated forthwith in such manner as they deem

proper, and all expenses incurred shall be a legal claim against the owner and a lien upon the premises, to be collected in the same manner as other special assessments. The said Board may also, when they deem it requisite for the public health, at once, and by force, if necessary, close up such houses, buildings, hotels and premises, and exclude all occupants therefrom until such nuisance shall be fully abated, and the air of such building or premises is thoroughly purified. Any person who shall resist the action of the Board, or their agents, under this subdivision, shall be liable to penalties hereinafter provided.

SEC. 2. Every physician, or person acting as such, who shall have a patient sick of the small-pox, varioloid, or other infectious or pestilential disease, shall forthwith report the fact in writing to the said Board, together with the name and the street, and the number of the house where such patient is treated; and every keeper, superintendent or person in charge of any pest-house, within the corporate limits of the city of Detroit, or any other pest-house under the control of the authorities of said city, to which any person, being a city charge, may be brought sick with infectious or contagious disease, shall at once on the arrival of every such person, give notice thereof in writing to the said Board: Provided, that if the person thus brought to such pest-house is a county charge, the notice herein required shall be given also to the County Physician.

SEC. 3. It shall be the duty of the occupants of any dwelling-house or other building in which there shall be small-pox, varioloid or any infectious disease, to put up and maintain in a conspicuous place on the front of such building a card, or sign, to be furnished by the Board of Health, on which shall be written or printed the words "Small-Pox" or any infectious disease, and such sign or card shall be kept on such building during all the time any person so diseased shall remain therein, and until permission is obtained in writing from the Board of Health to remove the same. No person shall take down, remove, injure or deface such card or sign at any time during the time in which the same is required to be kept up and maintained.

SEC. 4. All persons having small-pox, varioloid, or other contagious or infectious disease, are hereby required to be kept closely confined within their respective dwellings, or places of abode, and no person who has been confined with such disease, shall leave his or her place of abode, and go about the city until, in the opinion of the Board of Health, it can be done without danger of communicating the disease to others.

SEC. 5. No person having the small-pox, varioloid, or other contagious disease, shall go about the city, or in any yard, commons, or place so as to endanger the health of other persons.

SEC. 6. No person shall bring, or cause to be brought, into the city of Detroit, any person infected with the small-pox, varioloid, or other infectious or pestilential disease.

SEC. 7. No owner, driver or person in charge of any public hack, carriage or conveyance, shall use, or permit the same to be used, for the purpose of conveying the body of any person who has died of the small-pox or varioloid, or other infectious disease, or any person from any house, building or place, in which any person is sick, or has within two weeks died of either of said diseases.

SEC. 8. Every physician having a small-pox or varioloid patient, immediately after each and every visit to the same, shall not visit any other patient, except those affected with the small-pox or varioloid, until he has changed his clothing and otherwise disinfected himself; and every undertaker having in charge the body of any person who has died of either of said diseases, immediately after the interment thereof, and any person nursing or taking care of any person sick with either of said diseases, before going upon the streets, shall change his clothes and otherwise disinfect himself.

SEC. 9. The said Board shall keep a complete record of all its proceedings, operations and expenditures in books for that purpose provided, which shall at all times be open to inspection by any committee of the Common Council. All debts contracted by said Board shall be paid by the city in the same manner that other demands against the city are paid.

SEC. 10. Said Board shall keep, subject to the inspection above provided, a full and complete record of the deaths of all persons dying in the city, including the dates and causes of death, places of burial, place of birth, age of the deceased and names of attending physicians and undertakers, and also a record of the causes, incidents and circumstances of all contagious, epidemics or infectious diseases originating in said city.

SEC. 11. The said Board, at the end of each month, shall report to the Common Council in detail the amount and cause of all their expenditures during the month, the number and causes of death of all persons dying during the month, the places of burial, nuisances looked after and matters investigated.

SEC. 12. The keeper of any hotel, tavern, boarding or other public house, or the owner or occupant of any private house or residence in which any person may be sick with small pox, varioloid or other infectious disease, or the physician, or person acting as such, who shall have a patient afflicted with any such infectious disease, shall forthwith report the same to the Board of Health, and to the Superintendent of Police; and the keeper or keepers of said hotel, tavern, boarding or public house, or the owner or occupant of said private residence as aforesaid, shall thereupon immediately procure, put up and maintain in a conspicuous place on the front of said premises a card or sign with the words "small-pox" printed thereon in large letters, which card shall not be removed, injured or defaced by any person, and shall remain posted on the premises during all the time any person afflicted with any infectious disease shall remain therein, and until the taking down of such card is advised by the physician attending such diseased person.

SEC. 13. It shall be the duty of the keeper of any hotel, tavern, boarding or public house, or the owner or occupant of any private residence wherein any person may be sick with small-pox or other infectious disease, to close said public house or private residence, and keep it closed as against all lodgers, customers and persons desiring to visit the same, and to prevent the occupants of said public house or private residence from leaving said premises until such time as in the opinion of the Board of Health all danger of communicating the disease from said house or residence, or from any of the inmates thereof, shall have passed: Provided, That the provisions of this section shall not apply to physicians or clergymen in attendance upon such sick person or persons, nor to policemen on duty in and about the premises.

SEC. 14. Immediately after the termination of a case of small-pox, varioloid or other infectious disease, by the convalescence or death of the person or persons afflicted, it shall be the duty of the attending physician, or in case no regular physician has been in attendance, then of the city physician of the district, to examine the bedding, clothing and wearing apparel of the convalescent or deceased person, as the case may be, and shall order all such articles to be disinfected by washing, or the use of such disinfectants as may be necessary, and to order the destruction by fire of such articles as in his opinion cannot be disinfected.

SEC. 15. It shall be the duty of the physician in attendance on any person or persons sick with any contagious or infectious disease, to give all necessary instructions regarding the thorough ventilation and cleansing of the public house or private residence wherein such person shall be sick. And it shall be the duty of the keeper of such public house, or the owner or occupant of such private residence, to follow the instructions of the physician in attendance as aforesaid, under the penalty hereinafter provided.

SEC. 16. In case of the death of any person from small-pox or varioloid, the body of such deceased person shall not be taken to or inside of any church, public building or other public place, nor to any private residence or building other than that upon the premises where said death occurred; but said body shall be privately conveyed to any proper cemetery between the hours of seven o'clock in the evening and seven o'clock of the following morning, and therein buried without any public demonstration or public funeral service whatsoever, unless otherwise ordered by the Board of Health.

Sec. 17. The meat inspector and members of the police of said city shall co-operate with said Board in all matters pertaining to the abatement of nuisances and the preservation of the public health, and, upon the requisition of said Board, the Superintendent of Police shall cause the notices of said Board to be served and complaints to be made for violations of the health ordinances of said city.

Sec. 18. The said Board and its health officer shall have authority to discharge all the duties relating to the health and sanitary condition of said city, now or heretofore discharged under any existing ordinance by any other officer of said city.

Sec. 19. The salary of the health officer of said city shall be in a sum not exceeding $3,000 per annum, and as the Board of Health may from time to time agree upon and recommend to the Common Council.

Sec. 20. Chapters eighty-two and eighty-three of the revised ordinances of 1878, and all other ordinances and parts of ordinances inconsistent with the provisions of this ordinance, are hereby repealed.

Sec. 21. Violation of or failure to comply with the provisions of this ordinance, or failure or neglect to comply with any of the requirements of the Board of Health, shall, on complaint to the Recorder's Court, be punished by a fine not to exceed five hundred dollars and costs, and in the imposition of any such fine and costs the Court may make a further sentence, that the offender be imprisoned in the County Jail or Detroit House of Correction until such fine and costs be paid: Provided, however, that the term of such imprisonment shall not exceed the period of six months.

SEC. 22. This ordinance shall take immediate effect.

Approved August 16, 1881.

W. G. THOMPSON,
Mayor.

Attest:
LOUIS DILLMANN,
City Clerk.

The above is one of the most comprehensive health ordinances ever passed by a municipal legislature in this country, and will bear its good fruits in the years to come. Even those who conscientiously opposed it will in time be proud to have been members of the Common Council which passed it. Some of the provisions of this ordinance are stringent, but they have ample foundation in the city's charter. That the Common Council had abundant legislative authority therefor, will fully appear from the following

SECTIONS OF THE FUNDAMENTAL LAW

of the municipal corporation:

(§ 171.) SEC. 36. The Council shall have power to provide for the preservation of the general health of the inhabitants of said city; to make regulations to secure the same; to prevent the introduction or spreading of contagious or infectious diseases; to prevent and suppress diseases generally, and, if deemed necessary, to establish a Board of Health, and prescribe and regulate its powers and duties; to prohibit, prevent, abate, and remove all nuisances in said city, or within the distance therefrom of half a mile, and to punish the authors and maintainers thereof, and authorize and direct the speedy or immediate abatement or removal of nuisances, by some officer of said city. If in order to abate or remove any nuisance, the Common Council shall deem it necessary to fill up, level or drain any lot or premises, they shall have power so to do; to assess the cost and expenses of such filling, leveling or draining, and impose the same as an assessment or tax on said lot or premises, which shall be a lien thereon till paid, and shall be collected in the same manner as other taxes and assessments, levied and imposed by authority of the Common Council; it shall also have power and authority to compel the owner or occupant of any grocery, cellar, tallow chandler's shop, soap, candle, starch or glue factory, tannery, butcher's shop or stall, slaughter-house, stable, barn, privy, sewer, or other unwholesome or nauseous house or place, to cleanse or abate the same, whenever necessary for the health, comfort, or convenience of the inhabitants of said city; to prohibit and prevent any person from burying, depositing or leaving within the limits of said city, or within one mile distant therefrom, or keeping or having on the premises owned or occupied by him, in said city, any dead carcass, putrid or unsound beef, pork, fish, hides and skins, and any article, substance or thing that is unwholesome or nauseous, and to compel and authorize the removal thereof by some officer of said city, or to compel any person so bringing, depositing or leaving within the limits of said city, or within one mile distant therefrom, or keeping or having on the premises owned or occupied by him in said city, any dead carcass, putrid or unsound beef, pork, fish, hides and skins, and any article, substance or thing that is unwholesome or nauseous, and to compel and authorize the removal thereof by some officer of said city, or to compel any person so bringing, depositing or leaving the same within the limits of said city, or one mile distant therefrom, or having or keeping the same on the premises owned or occupied by him in said city, to remove the same. [*As added by Act No.* 282, *Session Laws of* 1871.]

(§ 172.) SEC. 37. The said Council may direct and regulate the construction of cellars, slips, barns, private drains, sinks and privies; compel the owner or occupant to fill up, drain, cleanse, alter, relay or repair the same, or to cause the same to be done by some officer of the corporation, and assess the expenses thereof on the lot or premises having such cellar, slips, barn, private drain, sink or privy thereon, which assessment shall be a lien on such lot or premises, and be collected in the same manner as other assessments imposed by authority of the Common Council. It may also direct and regulate the construction of lateral sewers or drains, for the purpose of more effectually draining all lots, or cellars, yards and sinks within the limits of said city, whenever, in their opinion, the same shall be necessary. Such lateral sewers or drains shall be laid or constructed through any of the streets or alleys adjoining, or in front of the premises through which sewers or drains shall be ordered constructed, and assess the expenses thereof on such lots or premises benefited thereby, which assessment shall be a lien on such lots or premises until paid, and be collected in the same manner as other assessments imposed by authority of the Council. [*As added by Act No.* 282, *Session Laws of* 1871.]

I shall have occasion to refer subsequently to these provisions of the charter in support of other ordinances now in force, and in connection with measures proposed for the proper sanitary administration of the city. Reference to them will also be necessary in explaining why certain sections of some existing ordinances cannot be enforced, or only partially enforced.

ORGANIZATION FOR ADMINISTRATIVE SANITARY WORK.

"*As physicians have their attention more frequently and forcibly called to the evil results of a bad sanitary condition of the people, they are usually the first to urge legislation on the subject. But, as Mr. Eaton remarks, 'The moment we attempt to exercise political power for sanitary purposes, that is, to use the government for compelling citizens to observe the general conditions of public health, and to pay the penalty of the infringement and the cost of redress, we must not seek our official force wholly from any one profession.' No single profession has either the knowledge or the power to accomplish such work, and although it may be hoped that, in the good time coming, the health official will combine in one person the special knowledge of the physician, the lawyer, the engineer, and the chemist, yet, for the present, members of each of these professions must unite to secure good work.*"
—BILLINGS.

ORGANIZATION FOR ADMINISTRATIVE SANITARY WORK.

The Board of Health, at a meeting on the 6th of September, 1881, unanimously appointed Dr. O. W. Wight, Health Officer. The doctor accepted the appointment and entered upon the duties of the office on the 3d of October following.

At a meeting of the Board, held on the evening of the same day, in conjunction with the City Attorney, the Health Officer submitted a general plan of administrative sanitary work, with carefully drawn circulars, blanks and orders, for carrying out the same. After long and earnest consultation, the plan was unanimously approved and the circulars, blanks, etc., were ordered printed.

The Board was without offices, furniture or other appliances for carrying on regular work. The Health Officer was assigned a temporary desk in the Controller's office, and busied himself several weeks in a miscellaneous way, attending to sundry complaints of nuisances, getting acquainted with city officials and citizens, superintending the finishing and furnishing of offices in the new market building intended for his department, and supervising the necessary printing of blanks and the preparation of record books. About the middle of November everything was in readiness, when work was begun in a systematic way. Circulars, or general orders, were simultaneously issued to physicians, undertakers, heads of schools, superintendents of cemeteries, and to various city officers, directed, by the general sanitary ordinance of August 16, 1881, to co-operate with the Board of Health. These general orders are here reproduced in more convenient and permanent form for reference, with such explanation and commentary as will make clear their general scope and practical aim.

TO PHYSICIANS AND PERSONS ACTING AS SUCH.

In pursuance of an ordinance of the City of Detroit, entitled "An Ordinance concerning the duties of the Board of Health of the City of Detroit, and providing for the maintenance of the Public Health," approved August 16, 1881, it is hereby ordered by the Board of Health aforesaid, that every physician, or person acting as such, shall

1. Report in writing (according to "Form 2," adopted by said Board of Health,) to the Health Officer, at the office of the Board, every patient he shall have laboring under any pestilential, contagious or infectious disease, immediately—at longest within twenty-four hours—after he shall ascertain or suspect the nature of such disease;

2. Report in writing (according to "Form 6," adopted by said Board of Health,) to the Health Officer, at the office of the Board, the death of any patient who shall have died of any disease, within twenty-four hours thereafter, and to state in such report the specific nature and type of such disease.

Any neglect or refusal to perform the duties herein required will be followed by prompt and firm prosecution. The maximum penalty is five hundred dollars ($500) and costs, for non-payment of which the Court may sentence to six months' imprisonment.

Forms "2" and "6," and also Form "4," for reporting recoveries, will be supplied to physicians free of charge. Forms "2" and "4"[1] may be mailed to the Health Officer, but always at the physician's risk, that they will reach their destination within the prescribed time. Certificates of death may be sent by the undertaker in charge of the burial, but they must arrive at the Health Office within the twenty-four hours allowed.

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[1] These forms will be given and fully explained in subsequent pages.

Physicians will not, under any circumstances, give permission to remove placards from infected houses, without a special order from the Board of Health. The Health Department will send a skilled person, at the public expense, to disinfect houses before the removal of placards.

Small-pox (including varioloid), scarlet-fever (including scarlatina), and diphtheria (including membranous croup), are the infectious diseases at present required to be reported. Other diseases, such as Asiatic cholera, malignant measles, typhus and typhoid fevers, cerebro-spinal meningitis, and puerperal fever, especially if they prevail in epidemic form, may from time to time be added, of which due notice will be given.

Physicians will be especially careful not to report recovery from infectious disease, until all possible danger of contagion is over. If families become impatient, the Public Health authority will take the responsibility of delay. All considerate and reflecting people, it is presumed, will co-operate with the Board of Health in carrying out measures for preventing the spread of deadly, communicable diseases, in accordance with the requirements of beneficent laws enacted by the representatives of an enlightened community. It is not doubted, that the profession, above all others devoted to the public good, will nobly and gladly lend its aid in furthering efforts to exterminate zymotic diseases. We ask our medical brethren of all schools of practice—and we believe that we do not ask in vain—to aid us in disseminating sanitary knowledge among the people, and to set an example to others of obedience to sanitary regulations for the common good.

By Order of the Board of Health.

O. W. WIGHT, M. D.,
Health Officer.

THE PROFESSION IN DETROIT,

To their great credit, promptly complied with the requisitions of this general order of the Board of Health. A very few delinquencies at the outset were obviously the result of a careless habit, rather than of design, requiring only a formal admonition for cure. Such frivolous excuses as the British profession is now making in opposition to a proposed general system of reporting contagious diseases to health authorities, has never been heard in my office from the lips of a Detroit physician. The pretense that reporting a contagious disease is betraying the secret of a patient, is too shallow, even for a " person acting as such." Just as though any mortal had a right to make a secret of small-pox, or other deadly infectious disease, to the danger of the public! Just as though any doctor could be under a moral or professional obligation to help guard such a secret!

Not one of our practitioners has seriously mentioned compensation for such service to the public, although the public, through the proper legislative authority. has not been at all generous with the profession in protecting it from a wholesale invasion of quacks.

The Health Officer has reciprocated the courtesy and good will of the medical profession. The medical attendant's diagnosis of infectious diseases has been accepted as final, and no *ex cathedra* revision of such diagnosis, has, in any instance, been attempted. The Health Officer and the medical members of the Board have always been willing to aid and advise, when called upon to decide in cases of conflicting views between practitioners, and to take their share—more than their share –in assuming the responsibility of an early, consequently safe, determination of the disease in suspected cases of small-pox.

TO UNDERTAKERS AND PERSONS ACTING AS SUCH.

In pursuance of an ordinance of the City of Detroit, entitled " An Ordinance concerning the duties of the Board of Health of the City of Detroit, and providing for the maintenance of the

Public Health," approved August 16, 1881, it is hereby ordered by the Board of Health aforesaid, that

1. Upon the death of any person within the corporate limits of the City of Detroit, it shall be the duty of every undertaker or other person who inters such deceased person, and before the removal of such deceased person for interment, and within thirty-six hours after the death of such person, to apply to the Health Officer of said City, to obtain a permit for interment, from said Health Officer, and such permit shall be issued only upon the certificate of a physician, of the Health Officer, or of the Coroner;

2. Such permit for interment as aforesaid, shall in every case accompany the remains of such deceased person to the place of burial;

3. When the cause of death of such deceased person is a contagious, infectious or pestilential disease, required by the Board of Health to be reported to the Health Officer, the undertaker, or person acting as such, shall not take the remains of such deceased person to any church or other public place for funeral services, nor open the coffin at the grave, or elsewhere, for view of such deceased person, nor allow any persons under twenty-one years of age to act as pall-bearers at the funeral of such deceased person;

4. When the cause of death of such deceased person is small-pox, or varioloid, the undertaker, or person acting as such, shall not take the body to any building, public or private, other than that upon the premises where said death occurred, but shall privately convey said body to any proper cemetery between the hours of seven o'clock in the evening and seven o'clock of the following morning, and bury the same therein without any public demonstration or public funeral service whatsoever, unless otherwise ordered by the Board of Health;

5. And every undertaker, or person acting as such, shall make report, under oath, to the Health Officer, at the beginning of each month, of all burials made by him during the previous

month, according to Form "8," adopted by the Board of Health.

Copies of Form "8," for making such report, can be obtained at the Health Office, free of charge.

Neglect or refusal to comply with these regulations, will be followed by prompt prosecution. The maximum penalty is five hundred dollars ($500) and costs, for non-payment of which, the Court may sentence to six months' imprisonment.

By Order of the Board of Health.

O. W. WIGHT, M. D.,
Health Officer.

THE UNDERTAKERS OF DETROIT,

As a rule, willingly and uncomplainingly obeyed this order. A few were refractory and threatened direful things. One came to the department in a very ferocious mood and went away very quietly, remarking to an outsider that he "had gone there for the purpose of giving the health office h—l, but had got h—l enough to last him the rest of his life." A tongue that sometimes, on due provocation, has in it "a snatch of Tartarus and the souls in bale," to use old Kit Marlowe's vigorous phrase, may on occasion be more effective than a criminal court. Undertakers of conscience, with a proper feeling in regard to their solemn calling, gladly welcomed the new order of things, as requiring circumspection, propriety and becoming scrutiny in the burial of the dead. A very few who were in the habit of putting human beings under the ground like cats or dogs, who forged the names of physicians to death certificates to save themselves trouble, who disposed of the victims of abortion and other crimes with secrecy and dispatch, who shipped the remains of persons deceased with infectious disease to distant communities without care of consequences, would have resisted if they could, but found themselves helpless between the health office and the cemetery authorities, and had to yield, especially with prosecution staring them in the face. It is now a long time since a murmur has been heard, and the new order of properly registering the dead before burial has been permanently established in Detroit, as in all other large cities throughout the civilized world.

TO THE SUPERINTENDENTS OF CEMETERIES.

In pursuance of an ordinance of the City of Detroit, entitled "An Ordinance concerning the duties of the Board of Health of the City of Detroit, and providing for the maintenance of the public health," approved August 16, 1881, it is hereby ordered by the Board of Health aforesaid, that the Superintendent of any cemetery within the jurisdiction of the said City of Detroit,

1. Shall not receive a dead body for burial from any Undertaker, or person acting as such, when such body is not accompanied by a burial permit (according to Form "7," adopted by said Board of Health) properly issued by the Health Officer, which said burial permit may be received and retained in lieu of a certificate of death signed by a physician;

2. Shall not disinter, nor allow to be disinterred, any dead body except upon a special permit therefor, signed by the President of the Board of Health and the Health Officer;

3. And shall not place in a public or receiving vault the dead body of any person deceased of a pestilential, infectious or contagious disease, but shall cause such body to be immediately buried.

Any neglect or refusal to perform the duties herein required will be followed by prompt prosecution. The maximum penalty is five hundred dollars ($500) and costs, for non-payment of which the Court may sentence to six months' imprisonment.

By order of the Board of Health.

O. W. WIGHT, M. D.,
Health Officer.

THE GUARDIANS OF CEMETERIES,

In Detroit, are humane, responsible, enlightened men, and hailed with joy a system that enables them to keep with greater accuracy the records of these silent cities of the dead. Certificates of death that must be scrutinized by experienced eyes in the health office, before a burial permit is issued, are made with more care by heedless physicians, and causes of decease are stated with more accuracy when it is known that they must go on permanent record. The domineering and reckless Undertaker submits with peaceful quietude, when he knows that the Superintendent of the cemetery will lock his gate against him, unless he comes with the proper permit from the health authority.

Thus the mortuary statistics of the city are for the first time complete and accurate. No unrecorded burial can take place, without a successful conspiracy between a doctor, an undertaker and the guardian of a cemetery. As there can be no adequate motive for such a conspiracy, it is not likely to take place. Of course, crimes may be committed, and the victims of crimes may be concealed in the earth or the flowing river; but the "bride of lust," and the "companion of the poisoner," cannot be carried past the temples of justice in open day to be hidden away under the forms of honest burial, without the scrutiny afforded by enlightened law, honestly and fearlessly administered.

The dead cannot be removed from the cemeteries to distant places, or from one cemetery to another, or even from one grave to another in the same cemetery, without official record and a proper permit. Thus are the remains of our people safe against the hands of intruders, and friends are not unfrequently warned by the health authority of dangers unsuspected by those who have no professional training.

AUTHORITY

For some of these regulations at first existed only in the published orders of the Board of Health, made under powers granted by State statutes, until the Common Council, willing to place the new sanitary administration on the undisputed basis of municipal law, unanimously passed the following

ORDINANCE

To amend section 12 of chapter 85 of the Revised Ordinances of 1878.

It is hereby ordained by the people of the City of Detroit:

SECTION 1. That section 12 of chapter 85 of the Revised Ordinances of 1878, be, and the same is hereby, amended so as to read as follows:

SEC. 12. It shall be the duty of every undertaker, or other person acting as such, having in charge the interment of any deceased person, to deposit with the City Sexton, or Sextons, or Superintendent of the Cemetery wherein said interment is to take place, the proper burial permit from the Board of Health; and it shall be the duty of the City Sexton, Sextons and Superintendents of Cemeteries in the City of Detroit to keep a register, to be provided by the city, of all persons buried in each of said Cemeteries, giving in alphabetical order the name of the deceased, the number of the lot in which the body was buried, a true copy of which register shall be certified to weekly by such Sextons and Superintendent, and filed in the office of the Board of Health.

No body or remains of any deceased person shall be buried or interred in any cemetery, burial ground or other place within the city limits unless the proper permit therefor has been issued by the Board of Health.

In case of the death of any person in the city, every physician or person acting as such, who had charge of or was in attendance upon such person at the time of death, shall forthwith file in the office of the Board of Health a certificate stating all the particulars as to the name, age, sex, nativity, social condition, date and manner of death, name and character of disease, and such other information and details as may be required by said Board. In case of no private physician, or person acting as such, being in attendance, the City Physician of the proper district shall promptly make an examination and file a certificate as above required.

SEC. 2. This ordinance shall take immediate effect.

Approved January 7, 1882.

FORMS.

On the following page is a copy of the death certificate used, which sufficiently explains itself:

Form 6.—B. of H. OBSERVE NOTE ON MARGIN. OFFICE IN CENTRAL MARKET BUILDING.

☞ Physicians are required by the Board of Health to fill out this Certificate accurately, AND DELIVER IT TO THE HEALTH OFFICER within twenty-four hours after the death of the person to whom it relates.
MAXIMUM PENALTY, for neglect of so doing, $500.

CERTIFICATE OF DEATH.

No..........

FOR THE MONTH OF.. IN THE CITY OF DETROIT, MICH.

1. Name,...Color..............................
2. Sex,.................................Married,..........................Single,...................
3. Age,..
4. Name of Father of Deceased..................................Nativity,..........................
5. Name of Mother of Deceased,..................................Nativity,.........................
6. Occupation of Deceased,...
7. Place of Birth of Deceased, (Town, County, State.)..
8. Name of Wife of Deceased,...
9. Name of Husband of Deceased,..
10. Date of Birth,.............................Date of Death,.................................
11. Cause of Death,...
12. Duration of Disease,..
13. Place of Death,...........................Street...Ward,
14. Place of Burial,..
15. Undertaker,...

Residence of Physician,...

Detroit,......................188 ....M. D.,

Attending Physician.

Burial Permit No..........................Dated..............................188.. To be buried..............................188..

☞ No Burial Permit will be issued upon this Certificate unless correctly filled out, signed and returned by the attending Physician or Coroner.

Form 7—B. of H.

BURIAL PERMIT.

Keepers of Cemeteries will make returns for all permits for burials to the office whence issued, on the first Monday of every month.

No.................

HEALTH DEPARTMENT.

BUREAU OF VITAL STATISTICS.

Detroit,.. 188

Permission is hereby given...*to remove*

the remains of...

Date of Death,.......................................*Age,*.........*yrs.,*.........*mos.,*.........*days.*

Place of Death,...*Ward.*

Cause of Death,...

Medical Attendant,..

To......................................*for Interment*......................................*188*...

....

This Permit must in All Cases accompany the Body to its Destination. **Health Officer.**

The burial permit is issued only on the receipt by the Health Officer of a certificate of death, which is placed on file and carefully preserved. The burial permits are consecutively numbered and bound in volumes of one thousand each. The permit, when torn out for the use of the Undertaker, leaves a stub in the bound volume on which are entered the corresponding No., the date, name, " to whom issued," and " where inter. red," to be preserved among the permanent records.

As a further check, each Undertaker is furnished with a blank on which, at the beginning of each month, he must make returns, under oath, to the health department, of all persons buried by him during the previous month, giving name, time when buried, where buried, date of permit, No. of permit, name of person who signed certificate, date of death, etc. The Superintendent of each cemetery also makes full returns at the beginning of each month. Any discrepancy between the returns of the Undertaker and the cemetery authority is quickly perceived and leads to immediate investigation. Thus the last degree of accuracy is secured and forms the basis of reliable mortuary statistics.

The results thus obtained are transcribed into a huge mortuary record book, wherein are given the No. of certificate, name, color, sex, single or married, age, occupation, when born, date of death, disease, place of death, (including street and No.) cemetery, (including lot and section), attending physician, and date of interment. As fast as entries are made, the names are included in a carefully kept index, so that the full record can be found at a minute's notice. Transcripts of these records, under the seal of the office, are received as evidence, not only by our own courts, but also by the courts of foreign countries. They are not unfrequently of the highest importance in the settlement of estates.

The office is sadly in need of a proper vault or safe for the preservation of these papers and records, which sooner or later, may be of vital use to citizens.

The sanitary value of such accurate mortuary statistics is very great, for they enable the Board of Health to know the No. of deaths and the cause, each day in the year.

TO PRINCIPALS OF PUBLIC SCHOOLS AND PROPRIETORS OF PRIVATE SCHOOLS.

In pursuance of an ordinance of the City of Detroit, entitled " An Ordinance concerning the duties of the Board of Health of the City of Detroit, and providing for the maintenance of the public health," approved August 16th, 1881, it is hereby ordered by the Board of Health aforesaid, that:

1. Whenever the Principal of any Public School, or the responsible head of any Private School, in the City of Detroit, receives from the Health Officer of said city a notification that contagious, infectious or pestilential disease exists in any household of said city, such Principal of Public School or responsible head of Private School, shall reject from his school all pupils from such household, until he receives further notice from the same source, that such disease no longer exists in said household and that the premises have been disinfected;

2. The Principals of all Public Schools shall reject from the schools under their charge all pupils who have not been properly vaccinated or have not had small-pox, or varioloid.

Neglect or refusal to comply with these regulations will be followed by prompt prosecution. The maximum penalty is five-hundred dollars ($500) and costs, for non-payment of which the Court may sentence to six months' imprisonment.

By Order of the Board of Health.

O. W. WIGHT, M. D.,
Health Officer.

A CONTROVERSY

Of threatening proportions arose out of this innocent and unsuspecting order. A portion of it is here reproduced, not for the purpose of reviving it, but for the purpose of re-stating in more enduring and accessible form the legal basis on which the Board of Health is authorized, by State statutes, to make reasonable regulations in regard to sanitary matters, not provided for in any other way. The Board of Education and the Board of Health soon discovered that they were working in exactly the same direction, and not only quit fighting, but began co-operating, with mutual respect and esteem, for the public good. Death has since closed the eye-lids of a gifted and respected participant in the controversy, and the Health Officer signed his burial permit with moistened eyes, forgetting blows given and received. May his ashes repose sweetly until the "great day," and may his memory remain fresh in the tender hearts of his many friends until we meet "over yonder," where "we shall know as we are known."

LETTER TO THE HEALTH OFFICER.

DETROIT, November 28, 1881.

HON. O. W. WIGHT,
Health Officer:

DEAR SIR—The Board of Education, at its last meeting, passed a resolution instructing the Committee on Health and Ventilation "to ascertain by what authority the Board of Health assumes to issue orders relative to the Public Schools."

In order that such committee may report fully to the Board at the next session, may I ask you to indicate under what authority the Board of Health assumes to issue orders in such cases, and by what authority such Board orders and directs the Principals of the Public Schools to reject from schools under their control, all pupils coming from households wherein contagious, infectious or pestilential diseases exist, and all pupils who have not been properly vaccinated, or have not had small-pox or varioloid, without reference to or in recognition of the Board of Education and its officers, notwithstanding the City Charter, which, in substance, provides, that all schools now organized within the City of Detroit "shall, under the directions and regulations of the Board of Education, be public and free to all children residing within the limits thereof, between the age of five and twenty, inclusive."

Respectfully yours,

C. E. WARNER,

Chairman of Com. on Health and Ventilation.

REPLY BY THE HEALTH OFFICER.

OFFICE OF THE BOARD OF HEALTH,
DETROIT, December 1, 1881.

HON. C. E. WARNER,
Chairman of Committee on Health and Ventilation:

DEAR SIR—Your communication of November 28, 1881, embodying a resolution of the Board of Education "to ascertain by what authority the Board of Health assumes to issue orders relative to the Public Schools," and your inquiries with reference thereto, has been received.

Allow me to say, at the outset, that the Board of Health has issued no orders relative to the Public Schools, as such. It has had no design, no thought even, of interfering with any function of the Board of Education. In my judgment, it would be altogether more profitable to the public if the Board of Education and the Board of Health would vie with each other in seeking ways of being mutually helpful, rather than in searching out points of difference, and of possible antagonism.

In response to your inquiries, as chairman of the committee to which the resolution of the Board of Education was referred, I will endeavor to point out the legal authority under which the Board of Health "assumed" to issue to Principals of Public Schools, directions to co-operate with the Board in shielding ten thousand children from the danger of contagious disease. These regulations regarded the Principals of Public Schools as gentlemen and ladies, placed by the nature of their profession in personal relation with the children of the people, with individual responsibility to the community, and not as mere agents of the Board of Education.

Section 13 of an ordinance of the City of Detroit, entitled "An Ordinance concerning the duties of the Board of Health of the City of Detroit, and providing for the maintenance of the public health," approved August 16, 1881, reads as follows:

"SEC. 13. It shall be the duty of the keeper of any hotel, tavern, boarding or public house, or the owner or occupant of any private residence wherein any person may be sick with small-pox or other infectious disease, to close said public house or private residence, and keep it closed as against all lodgers, customers and persons desiring to visit the same, and to prevent the occupants of said public house or private residence from leaving said premises, until such times, as in the opinion of the Board of Health, all danger of communicating the disease from said house or residence, or from any of the inmates thereof, shall have passed: Provided, That the provisions of this section shall not apply to physicians or clergymen in attendance upon such sick person or persons, nor to policemen on duty in and about the premises."

If, then, the Board of Health has authority in this ordinance to prevent the occupants of a private residence, where there is infectious disease, from leaving the same at all during the prevalence of the disease, still more has it authority to prevent the inmates of such an infected private residence from attending a school.

The Charter of Detroit enacts (§ 171), Sec. 36, that "The Common Council shall have power to provide for the preservation of the general health of the inhabitants of said city; to make regulations to secure the same; to prevent the introduction or spreading of contagious or infectious diseases, etc."

It is, therefore, very evident that the Common Council, in passing an ordinance with the aforesaid provision, was not transcending its delegated power. The ordinance is not otherwise legally "unreasonable," that is to say, it is not contrary to the constitution of the commonwealth, nor to the jurisprudence of the State.

The same ordinance, cited above, provides, in section 21, that "failure or neglect to comply with any of the requirements of the Board of Health, shall, on complaint to the Recorder's Court, be punished by a fine not to exceed five hundred dollars and costs." Of course "the requirements of the Board of Health" must not only be reasonable, but for the purpose of executing the provisions of ordinances passed in pursuance of constitutional powers granted by the Legislature to the Common Council.

From which it clearly follows, that a requirement of the Board of Health that Teachers in all schools of the city shall not admit pupils from houses where infectious diseases prevail is reasonable, lawful, just and demanded by the public safety. It is in strict accordance with common law, with the jurisprudence of Michigan, with the statutes of the State, with the municipal legislation of the city. Knowingly to admit a pupil from an infectious house, to the danger of unsuspecting children, is to criminally aid and abet a violation of law.

As to the authority to exclude unvaccinated children from the public schools, it rests upon a different foundation. The Common Council of Detroit has not legislated upon that subject. Now it is a settled principle of statutory law that a municipal Council cannot re-delegate the authority conferred upon it by a State Legislature in the provisions of a Charter to any other body. The Board of Health, therefore, cannot be authorized by the Common Council to make regulations in regard to any matter not already embodied in an ordinance. Hence the regulations already discussed, which the Council authorized the Board of Health to make for the execution of special provisions in a comprehensive sanitary enactment, must be restricted in the judicial interpretation of a municipal law, and cannot be extended in general to subjects in regard to which the Council has not exercised its chartered powers.

But while the municipal law-making body cannot re-delegate its unused authority to any Board within the city government, the legislature of the State can directly confer upon such subordinate agency the power to make regulations concerning matters that are within its special province. Thus the Legislature of Michigan has conferred upon Boards of Education the authority to make regulations concerning public schools independently of Common Councils. The Legislature can also confer upon Boards of Health power to make regulations, to enact by-laws, within their own special province. That regulations made by a board of Health, under powers directly granted by the Legislature of a State, have the force and effect of law, equally with the ordinances passed by a Common Council, and resting upon exactly the same foundation, has been the subject of judicial investigation, and has been sanctioned by the decisions of courts. Especially in the State of New York, the higher courts, the judges of which are eminent for legal learning and ability, have decided that the legislature of a State has precisely the same constitutional power to confer upon a municipal Board of Health the authority to enact regulations within its special province, binding upon the local community, as it has to enable a Common Council to enact ordinances, on a wider range of subjects, which shall have the force of local statutes. "The legislature," says the Supreme Court of that State, (People *ex rel.* P. Cox, Hun. 7, p. 214), "has the power to confer the authority to enact and enforce ordinances, not only on a municipal government, but on any department of a municipal government, as, for instance, on a board of health." This decision has been repeatedly affirmed. It is always implied that such regulations, like the ordinances of a Common Council, must be legally reasonable, that is to say, must not be unconstitutional, must not conflict with the statutes of the State, and the authority to enact them must be clearly delegated.

Various sections of chapter XLVI. of the Compiled Laws of Michigan, 1871, not only permit, but require, Boards of Health in the State to make regulations, concerning "nuisances," "sources of filth," "causes of sickness," "the public health and safety," "interment of the dead," "safety of the inhabitants against small-pox and other contagious diseases," etc. Penalties are provided for the violation of such regulations. The manner of publishing them is prescribed: "The provisions of this chapter, and the amendments thereto, shall, as far as applicable, apply to all cities and villages in this State." (1740) section 49. Subsequent enactments do not at all weaken, but, especially in regard to the prevention of small-pox, strengthen the mandatory character of these statutes.

Act No. 157, laws of 1879, imperatively requires the Health Officer "of each village and city in this State," to institute proceedings against any one for violating certain sections of the Complied Laws of 1871, cited above.

Act No. 146, laws of 1879, empowers "the Board of Health in each city, village and township" of the State to offer vaccination with bovine virus to every unvaccinated person, and to all persons not vaccinated within the previous five years, at the public expense.

Under the authority granted by the Legislature of Michigan, the Board of Health in this city has "assumed" to make a regulation to reject from the public schools children unprotected by vaccination or otherwise, against small-pox. Its authority to make such a regulation rests upon exactly the same foundation as that of the Board of Education, "to make by-laws and ordinances" relating to "census of children," "necessary reports," "visitation of schools," "employment and examination of teachers," "regulation of schools," "books to be used therein," "anything whatever that may advance the interests of education." If the Legislature has no constitutional power to clothe Boards of Health with the authority to make sanitary regulations, then it has no power to invest Boards of Education with the authority to make regulations concerning public instruction. In my judgment, the Legislature, either by special or general statutes, has the power to do both.

It is very certain that the Legislature has not granted to the Board of Health authority to make regulations for the advancement of education. It is equally certain that the Legislature has not granted to the Board of Education authority to make regulations for the advancement of sanitation. The Board of Education cannot enact a by-law rejecting unvaccinated children from the public schools. The supreme governing power of the State has conferred upon it no authority of that kind. It cannot transcend the specific grants made to it by the agency that created it. Therefore, an order to Principals of schools by the Board of Education, to reject unvaccinated children from their schools, a measure to enforce vaccination, for the purpose of protecting the public against returning epidemics of a loathsome disease, would be null and void in law, for no such authority has been conferred upon that Board. Hence the Board of Health, which has been invested with that authority, issued its order direct to the Principals of the schools. When the Principal of a school has to be notified not to admit fugitive children from infected houses, the immediate safety of a thousand pupils demands that the notice should be sent directly, and not await a meeting of the Board of Education, perhaps a week subsequently, to determine by resolution whether the notice could be forwarded at all. The lives of the children of the people cannot be jeopardized in order to give the Board of Education opportunity to discuss a matter wherein it has absolutely no jurisdiction.

The ventilation, heating, drainage, etc., etc., of public school buildings, come properly under the cognizance of the sanitary authority, and the Board of Education will be the proper agent to which to address any communications pertaining thereto. In fact, the Board of Education has the right to ask the co-operation and aid of the Board of Health in such matters. As to the great and noble work of public instruction, it belongs exclusively to the former, and the latter can have nothing officially to do with it. The vital question of school sanitation, however, cannot be ignored while energy is wasted and time is needlessly spent in tracing the exact boundaries of jurisdiction between the two Boards. The hearts and hopes of mothers and fathers in most of the households of the city follow the little ones daily to the schools. "Will they return well?" springs to the lips more frequently than "will they return with the lesson learned?" The pride and hope of parents are involved in "a good education" for their children. But much nearer the fountains of earthly existence are human suffering, constitutions broken for life, seeds of disease early sown, pain too deep for tears in the panting breast of many a little one, the immeasurable heart-ache of mothers, the silent sorrow of fathers, the solemn "dust to dust" and "ashes to ashes" closing blighted careers which sanitary wisdom, mingled with holy educational work, might have prolonged over the customary years of usefulness.

All our municipal Boards are only agencies of the city government for protecting and promoting the public interest and the general good. Their usefulness will certainly not be increased by discussing questions of punctilio.

O. W. WIGHT, M. D.,
Health Officer.

GENERAL ORDER NO. 5.

In pursuance of an ordinance of the City of Detroit, entitled "An Ordinance concerning the duties of the Board of Health of the City of Detroit, and providing for the maintenance of the public health," approved August 16, 1881, it is hereby ordered by the Board of Health aforesaid, that the Meat Inspector, Sanitary Policemen, licensed Scavengers, Contractors for removal and burial of dead animals, and City Physicians of Detroit, shall, on the receipt of a copy of this order, forthwith report to the Health Officer of the Board, for the performance of such duties as said Health Officer may, according to law, and under the instructions of said Board of Health, impose.

By order of the Board of Health.

O. W. WIGHT, M. D.,
Health Officer.

These officers promptly responded to the order, and their services to the health department are duly recorded in subsequent portions of this report.

MANAGEMENT OF CONTAGIOUS AND INFECTIOUS DISEASES IN THE CITY OF DETROIT.

" *The accidental perils which beset the young in the seed-time of health, and which we accept as evils which sanitarians are bound specially to combat, those serious perils which spring from the exposure of the body to the poisonous particles which produce disease by contagion or infection, come next before us for removal. We call these perils contagious diseases; we know the number of these diseases; we know that their number is limited, that it is confined to thirty at the most, and practically to little over half thirty. We know that the members of this class of diseases have different periods of incubation, that is to say, of period intervening between the reception of the poison and the development of the symptoms produced by the poison. We know that the symptoms of the diseases, once developed, run a regular course. We know that some persons are more susceptible to them than others. We know, that, to a certain extent, one attack of suffering from many of the diseases is a cause of exemption from future attack. We know that the diseases assume an epidemic or spreading character, and that each of them has its season in which its spread is so remarkable that its general course may be charted or outlined as connected with the time of weeks or months or years. And if, regarding the nature of the poisons which produce the diseases, we know least and are most divided, we have, at all events, this precious knowledge, that the poisons themselves are removable and destructible, so that they lie within the range of human control."*—B. W. RICHARDSON.

MANAGEMENT OF CONTAGIOUS AND INFECTIOUS DISEASES IN THE CITY.

So far as the public sanitary agency is concerned, contagious and infectious diseases may be divided into two classes: (*a*) those that may be allowed to run their course, under the exclusive management of the family and the physician, and (*b*) those that should be combated under regulations provided by law to prevent their spread. In the first class may be reckoned chicken-pox, mild measles, whooping-cough, etc. In the second class may be reckoned small-pox, scarlet fever, diphtheria, typhus fever, enteric fever, cholera, etc. It is not often that we have all the graver contagious and infectious diseases prevailing at the same time. In Detroit, we have at present no cholera, no typhus or enteric fever, no epidemic cerebro-spinal meningitis.

Some infectious diseases require to be regarded in the first or second class, according to the type of a prevailing epidemic. Sometimes a malignant form of measles prevails, when, for a period, it would be necessary to apply all the machinery of repression. Ordinarily, measles are not very dangerous, and as the disease is inevitable sooner or later, and is less fatal in childhood than in advanced age, it is better to let it take its course. When scarlatina is of a very mild type, it would be as well to let it run, but for the very important fact that susceptibility and danger rapidly decrease after the first dozen or fifteen years of life. Enteric fever also becomes rarer and rarer after thirty years of age, and does not exist at all after forty-five or fifty. As one attack does not exempt from future attacks of diphtheria, the disease is always to be combated. It is not always easy to decide when, and to what extent, the health authority should interfere in the execution of measures to suppress communicable diseases. In all cases, private and public effort should be intelligently combined in struggling against these foes of mankind. And sanitary officers should always be clothed with authority, expressed or implied, to use discretion in the enforcement of measures for preventing the spread of contagious and infectious diseases.

There is no fact better established than this, to wit, that all epidemic diseases are increased in virulence by conditions of filth and unwholesome habits of life. While the public health authority can do very little in regard to the manner of living among the people, it can do a great deal in the way of removing and preventing unsanitary conditions. All effort in that direction tends to destroy the food on which epidemic diseases feed. The channels through which contagious germs travel from person to person are numerous, and therefore the work of the health authority cannot well be too comprehensive. I shall devote some space to hygienic considerations in connection with contagious and infectious diseases, after narrating with some detail the administrative methods adopted by the Board of Health for directly combating them.

Isolation and disinfection, together with vaccination as preventive of small-pox, constitute the fundamental principles of such methods. The aim is to prevent as far as possible exposure of the non-infected to the infected, to close up the channels through which contagion is conveyed from the sick to the well, and to destroy accumulations of disease germs when ever they can be reached. Here again it is not easy to determine the best means and the least annoying ways. It is not at all difficult to find fault, without any obligation or inclination to suggest something better.

ADMINISTRATIVE METHODS ADOPTED AND SUCCESSFULLY CARRIED OUT.

Physicians in the city are gratuitously furnished with postal-cards, on the backs of which is a blank to be filled, showing the name of the patient in full, number and street, age, disease and date. It requires but a brief time to fill out this blank at the bedside. The postal-card can then be dropped into the first letter-box which the physician passes after leaving the house, and it is sure to reach the Health Officer within a few hours.

The following is the form of this blank:

REPORT OF INFECTIOUS DISEASE

DATE,....................188..
Name of Patient, in full..................................
Age of Patient..................................
No. and Street, exact..................................
Name of Disease..................................
Place where Children from that house attend school..........
Signature of Physician, ..., M. D.

N. B.—The law requires EVERY case, whether in same family or not, to be reported "forthwith" in writing, with age, name and locality, under maximum penalty of $500.

☞Send or mail this card, promptly to Health Office.

When the card reaches the Health Officer, a clerk makes a registry of the case in a book kept for the purpose, enters the name in an index referring to the page in the book where the case is recorded, so that it can be instantly referred to at any subsequent time, and fills out the following blank order to the Sanitary Police:

(FORM 18.) OFFICE OF

THE BOARD OF HEALTH,

Detroit,———, 188—

TO THE SANITARY POLICE:

You are hereby directed to placard house No.——— ——— street, for ——— ——— in the family of ——— ——— ———, to leave with the family the enclosed circular, and to make returns herewith to this office.

By Order of the Board of Health.

——— ———, M. D.,
Health Officer.

The blank is returned to the office, with a written declaration on the bottom that the order has been executed, with the date of execution and signed by the officer by whom it is executed. As the blank is printed on a half note sheet there is plenty of room for such returns. It is then placed on file with other papers pertaining to the case, as a permanent record. The Sergeant of the sanitary squad of police comes to the office twice daily for these and other orders.

The placard is eleven by fourteen inches in size. The smallpox placard is printed in large black letters on a yellow ground, the scarlet fever on a red, and diphtheria on a lead-colored ground. On the top of the card is the name of the disease in the largest possible letters, under which is the following warning: "$500 fine for removing this notice without authority from the Board of Health. If removed, occupant of house must report to the Health Office within twenty-four hours, under the same penalty." On the lower half of the placard the same thing is repeated in German, as a large portion of the population are of that nationality.

If the disease is scarlet fever, the following is delivered by the policeman placarding:

CIRCULAR FROM THE BOARD OF HEALTH TO FAMILIES AFFLICTED WITH SCARLET-FEVER.

It is not the wish of the Board of Health to obtrude any special views in the treatment of a dangerous and highly contagious disease, or to supersede the directions of medical attendants. Their sole aim is to secure sanitary regulations for the protection of the public.

The " little ones " of a community are in most danger from scarlatina. All good citizens will co-operate with this department in efforts to prevent the spread of the disease. The regulations here following are condensed from a carefully prepared circular sent out by the State Board of Health of Massachusetts:

1. Scarlet-fever, scarlatina, scarlet-rash, canker-rash, and rash-fever are names of a contagious and infectious disease of varying degrees of severity, but in which all the forms are capable of conveying the most severe type. A person may become ill with fatal scarlet-fever from association with another who had so mild an attack of the disease as not to keep him in the house, much less in bed.

2. It is generally agreed among sanitarians, that scarlet-fever is conveyed from one person to another by means of epithelium or thin superficial covering which extends over the whole body, under the name of epidermis,cuticle, or scarf-skin, and which also lines the inner passages of the body. The exhalations from the outer or inner surfaces of the various parts of the body, and from the excretions also, are capable of transmitting the disease. Upon whatever the contagious matter depends for its dangerous character, it is capable of retaining its power to carry the disease for a long time—certainly, many months, and possibly for a year or more—unless destroyed.

3. The means of transporting the contagium of scarlet fever may be furnished by anything that has come in contact with an infected person or object—air, food, clothing, sheets,

blankets, whiskers, hair, furniture, toys, library-books, wall-paper, curtains, cats, dogs, etc. Funerals have occasionally spread the disease, the exhalations from the dead body being also dangerous.

4. The period from exposure which results in scarlet-fever, to the time when the symptoms manifest themselves, varies from several hours to three, and possibly four weeks. The average time is variously given from six to eight or ten days.

5. The time at which one who has been ill with scarlet-fever may safely mingle with other people is not always easy to determine; but it is, for convenience, usually placed by sanitarians at four weeks from the commencement of the illness, as that covers the vast majority of cases, and it is best to have some arbitrary rule. Some cases last much longer.

6. The patient should be placed in a room as much separated from the rest of the house as possible, and communicate with no more members of the household than is absolutely necessary.

7. The sick room should be well warmed and ventilated. It should be open to the sun, as free as possible from noise, dust, etc., and not "aired" by cold draughts, which are often more dangerous than a foul atmosphere.

8. All carpets, upholstered furniture, window hangings, and, indeed, unnecessary objects of every kind, especially woolen, should be removed from the room. Bits of carpet may be used, and burned after the need of them has passed.

9. The discharges from the throat, nose and mouth of the patient may be put in a vessel containing a strong solution of some "disinfectant," which shall be frequently washed with hot water; they should not be received upon anything which is to be kept. Pieces of soft cloth, which should be at once burned, may be used in place of pocket-handkerchiefs. The breath should be kept as pure as may be, by cleansing gargles and washes for the mouth. The discharges from the kidneys and bowels should be disinfected with boiling water, to which some

deodorizer may be added. Carbolic acid may be added as a "disinfectant" to the slops, and to the water in which the patient has washed, before throwing it out. The skin is usually more comfortable in feeling if cosmoline, etc., or sweet oil, with a couple of grains of camphor to the ounce, is used for anointing it; the scales of the epidermis are also thereby prevented, to a considerable degree, from escaping freely into the air. The bed clothes, towels, etc., when disused, should be removed with proper care, and be boiled for a couple of hours. The food left uneaten should never be carried where it may infect other persons.

10. Attendants on the sick should be as few as possible, and should not communicate with other persons any more than can be helped. They should wear only such clothing as may be readily washed. Clothes used in the sick room should be boiled before being worn elsewhere.

11. After recovery, the patient should not mingle with other persons, use lounges, carriages, public rooms, etc., liable to be used by others, until all roughness of the skin has disappeared, and until warm baths have been used for several days.

12. After the sick room is no longer needed as such, all the clothing and other matters used in it should be soaked in boiling water. Any articles of trifling value may be destroyed by fire. The ceiling should be washed with soap and hot water, or scraped. The floor and wood-work should then be thoroughly washed with soap and hot water. Scraping and re-painting would not be considered an excess of caution in time of epidemics.

13. Should the sick person die, the body ought not to be removed from the sick room until it has been sealed in the coffin, with carbolate of iron, carbolized earth, or some similar agent. The funeral must be as private as possible, and not attended by children. In no case must it be in a church or other public place. No one is allowed to ride in the same vehicle with the remains of a deceased person to the cemetery.

14. Anything which deteriorates health tends to render the system liable to any disease; and in that sense filth may be considered to promote scarlet fever or to increase its mortality. Perfect cleanliness should therefore be enjoined. Sewer gas, of course, is a kind of filth which may bring to one person's chamber, if it has access thereto, the contagium brought from another chamber and not disinfected. Finally, fresh air is one of the best disinfectants.

15. To disinfect soiled clothing, discharges of patients, or exposed water closets, the New York Health Department recommends the following: Half pound of sulphate of zinc and one ounce of carbolic acid in three gallons of water. Soak the clothing one hour. For the zinc, one pound of chloride of iron may be substituted.

16. To wash furniture, fixtures, etc., of infected rooms, use one pint of Labarraque's Disinfecting Fluid (chlorinated soda) in five pints of water.

17. Any good citizen will cheerfully submit to the temporary inconvenience of a warning-card on his house, for he cannot wish by any chance to expose others to the same affliction that has fallen upon his own household. The law requires it, and the Board of Health must enforce it.

18. All houses where contagious disease has existed will be disinfected by a competent person from the Health Office, at the public expense. The card will not be taken down until the case has terminated and the house has been disinfected.

19. Maximum penalty for sending a child to school from an infected house, is $500; same penalty[1] for going from an infected house to work in a factory or other public place.

O. W. WIGHT, M. D.,
Health Officer.

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[1] This part of the regulation is frequently relaxed, under guarded restrictions, except in case of persons going to work among children and youths in a factory or other place of business. It is very hard to prevent a poor man from earning bread for his sick household.

If the disease is diphtheria, the placarding officer delivers the following:

CIRCULAR FROM THE BOARD OF HEALTH TO FAMILIES AFFLICTED WITH DIPHTHERIA.

Whenever a card is placed upon a house, in accordance with the requirements of law, on account of the presence of diphtheria, a copy of this circular will be left with the family occupying it. The circular is not designed to supercede the work of educated physicians, but to aid them by giving sanitary information to citizens whose households are afflicted with a dreaded disease.

The brief description of the disease is condensed from Dr. Felix von Niemeyer, Professor of Pathology, and Director of the Medical Clinic of the University of Tubingen, one of the best and most authoritative medical writers in Germany. The sanitary rules to be followed in the management of diphtheria are taken in part from a circular issued by the State Board of Health of Massachusetts.

Diphtheria belongs among the infectious diseases, and even among those that are most typically *contagious*. The contagion is contained in the false membrane and shreds of tissue detached from the fauces, and in the air breathed out by the patient. Physicians are in great danger of being infected by the morbid products coughed out by the patient, when they are painting or cauterizing the throat. Science has to mourn the loss of a series of excellent physicians and observers who have fallen victims to diphtheria while in the line of their duty. The numerous cases of infection of persons who have been in the same room with diphtheritic persons, without coming in their immediate vicinity, prove that the air exhaled by the patient, which does not contain shreds of exudation or tissue, is a vehicle for the contagion.

The disease almost always begins with apparently insignificant and harmless symptoms. In some cases, the general health is disturbed a few days before the disease breaks out; the appetite is less; the patient complains of dullness, depression and chilliness. More rarely, the disease begins with a severe chill accompanied by nausea and vomiting. At the same time the patient complains of difficulty of swallowing, but in most cases, this is no greater than is usual in simple catarrh. If the fauces be not yet covered with false membrane, but only somewhat reddened and swollen, at this stage we can only suspect or recognize the disease when we know that diphtheria is epidemic, or that persons about the patient have, or have had, the disease. A very suspicious, and usually a very early symptom, is a hard swelling of the glands at the angle of the jaw in the neck. Not unfrequently the persons about the patient have their attention first called to the disease by swelling of these glands, the complaints of slight difficulty of swallowing having passed unnoticed. It is far more common for us to find more or less extensive grayish white patches in the fauces at our first examination, than to have the opportunity of examining the throat at the commencement of diphtheria, before the formation of false membranes has begun. And then we can have no doubt about the dangerous and malicious foe with which we have to deal. Even cases where the disease has begun without a chill, where the fever is slight, where the general health is excellent, so that the patient can hardly be kept in bed, we are not at all sure that the disease will run a favorable course.

If the disease has begun violently, its subsequent course is usually more severe. In many cases the putrefaction of the false membrane causes a penetrating, foul breath. If the nasal mucous membrane participate in the disease, a discolored, fetid fluid flows from the reddened and eroded nostrils. The swelling of the glands in the neck becomes more marked; the glands are hard, but have no tendency to suppurate. Even after a few days, death may occur from general paralysis, while the intellect remains clear. Some patients, whose state had not excited any anxiety, and whose general condition was previously very satisfactory, even die unexpectedly with the symptoms of general collapse, without our being able to find any explanation for the occurrence.

The disease, as above described, is greatly modified when the diphtheritic inflammation of the fauces is accompanied by croupous inflammation of the larynx and trachea; for then the symptoms are complicated with hoarseness, loss of voice, great difficulty of breathing, and other symptoms of croup. This complication occurs in mild, as well as in severe cases.

Even when the disease apparently ends in recovery, it is often followed by paralysis. Diphtheritic paralysis comes on from two to four weeks after the disease disappears. When the soft palate is paralyzed, the patients have a nasal voice; on attempting to swallow fluids, they enter the nose. This paralysis of the muscles near the seat of diphtheritic inflammation is most frequently accompanied by that of the muscles of the eye, and the patients begin to squint. The extremities also, especially the feet, are occasionally attacked by more or less complete paralysis.

The physician should protect himself from contact with the false membrane and shreds of tissue that are coughed up, and should warn attendants on the patient of the danger of this contact. When circumstances permit, those who have nothing to do with the care of the patient should keep out of the sick-room.

Families afflicted with diphtheria and attending physicians should carefully observe the following rules:

1. As diphtheria is always contagious, sometimes highly so, all practical means should be taken to separate the sick from the well.

2. As diphtheria is infectious, woolen clothes, carpets, upholstered furniture, curtains, etc., should be avoided in the sick-room, and only such materials used as can be readily washed.

3. All clothes, when removed from the person or bed of the patient, should be immediately placed in boiling water.

4. Pieces of soft linen or cotton cloth should be used instead of pocket handkerchiefs, and at once burned.

5. Disinfectants should always be placed in the vessels

containing the discharges from the throat, nose, kidneys and bowels. (Nitrate of lead and chloride of zinc are good.)

6. Pure air is the best of disinfectants, and should be supplied by free ventilation, but care must be taken not to expose patients to the cold.

7. Choose a room for the sick that has no connection with the sewers, by water-closet or by wash-basin. The highest room in the house, other things being equal, is the best.

8. In all cases of diphtheria, fully as great care should be taken in disinfecting the sick-room, after use, as in scarlet-fever or small-pox.

9. After a death from diphtheria, the clothing disused should be burned or put in boiling water; the body should be placed as early as practicable in the coffin, with disinfectants, and the coffin tightly closed; and the funeral must not be held in a church or other public place. No one is allowed to ride in the same vehicle with the remains of a deceased person to the cemetery.

10. Children at least, and better adults in most cases, should not attend a funeral from a house in which a death from diphtheria has occurred. In no case must the corpse be exposed at the funeral.

11. Diphtheria, like yellow fever, typhoid fever, and several other diseases, rarely, if ever, becomes epidemic, except in the midst of filth, especially the filth of privies, cess-pools, foul sewers, earth sodden with buried excrement, unclean cow-stables, putrid garbage, stinking hog-pens, stagnant water, etc. Let each good citizen co-operate with the Health Department in preventing the spread of contagious diseases, and in removing from our fair city the causes of epidemics.

12. To disinfect soiled clothing, discharges of patient, or exposed water-closets, the New York Health Department recommends the following: Half pound of sulphate of zinc and one ounce of carbolic acid in three gallons of water. Soak the

clothing one hour. For the zinc one pound of chloride of iron may be substituted.

13. To wash furniture, fixtures, etc., of infected rooms, use one pint of Labarraque's Disinfecting Fluid (chlorinated soda) in five pints of water.

14. Any good citizen will cheerfully submit to the temporary inconvenience of a warning card on his house, for he cannot wish by any chance to expose others to the same affliction that has fallen upon his own household. The law requires it, and the Board of Health must enforce it.

15. All houses where contagious disease has existed, will be disinfected by a competent person from the Health Office, at the public expense. The card will not be taken down until the case terminates and the house is disinfected.

16. Maximum penalty for sending children to school from an infected house is $500; same penalty[1] for going from an infected house to work in a factory or other public place.

O. W. WIGHT, M. D.,
Health Officer.

In cases of small-pox, the circular on the subject issued by the Michigan State Board of Health has been used. It is very full, explicit, clear and practical. It contains not only well-considered directions for the management of the disease, but also a complete exposition of the general laws of the State, regulating its isolation and control. The circular is too long to reprint here, for which there is less necessity, as it has been extensively distributed in the report of the State Board, and has been furnished to local health authorities throughout the Commonwealth. This office is indebted to the State Board for all the copies thus far necessary to use.

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[1] This regulation is as often relaxed in diphtheria as in scarlet fever, under the same precautions of not going into the presence of the sick.

SANITARY INSPECTION OF HOUSES WHERE CONTAGIOUS AND INFECTIOUS DISEASES EXIST.

After houses have been placarded and circulars delivered to families as aforesaid, an order is given to the official City Physician in whose district a case occurs, to make a sanitary inspection of the premises and report thereon to the Health Officer. These physicians are subject by law to the orders of the Board of Health in all matters pertaining to the sanitary condition of the city.[1]

The following is a copy of the order used:

Form 3—B. of H. No.——

HEALTH DEPARTMENT OF THE CITY OF DETROIT.

OFFICE IN CENTRAL MARKET BUILDING.

DETROIT, —— ——, 188 .

To ——— ———, M. D.:

It having been reported to this office that there is infectious disease, to-wit: ——— ———, in the house known as No. ——, ——— street, ——— Ward, you will proceed without delay to ascertain whether said house is placarded according to the requirements of law, and at the same time to ascertain whether the family has received the proper circular issued from this office for the sanitary management of such disease; to ascertain the number of persons exposed and the amount of exposure; to make diligent enquiry as to the contagious or other origin of the disease at that place; to make a careful personal examination of the sanitary condition of the premises and surroundings; and to make a written report to the Health Officer on all the points above indicated, with such other suggestions as you may think advisable. The examiner will not, by word, look or act, interfere with the practice of the attending physician.

By order of the Board of Health,

——— ———, M. D.,
Health Officer.

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[1] As there have been, since the opening of the office in November last up to the first day of June this year, 379 cases of scarlet fever, 424 cases of diphtheria, and 37 cases of small-pox, 840 cases in half a year, it would be impossible for the Health Officer to make all these inspections; yet he has personally attended to all premises in small-pox cases.

There is at the same time delivered to the inspecting physician a blank on which to make his report. The order is returned to the department with the report, after it is made out. Both documents are then numbered and placed on file with the other papers in the case.

The following is a copy of the blank on which the report is made:

Form 17—B. of H. No.——

HEALTH DEPARTMENT OF THE CITY OF DETROIT.

OFFICE IN CENTRAL MARKET BUILDING.

DETROIT, ———, 188 .

To ——— ———, M. D.,
Health Officer:

The undersigned has examined the premises at No........ ....street, in the family of.................. where.........is said to exist, according to your instructions, and found:

1. House ....placarded.................................
2. Children ......attending school at............ .. ..
3. Number of persons exposed..............................
4. The amount of exposure.................................
5. Origin of the disease at that place....................
6. Sanitary condition of premises.........................

The report must be signed and dated by the City Physician making it. One of the physicians disobeyed orders and undertook to re-diagnose the cases reported by the attending practitioners. He was severely rebuked by the Health Officer, who stated the attitude of the Board of Health on this delicate subject in the following terms: A medical practitioner, in obedience to law, and in good faith, reports to the Health Officer a case of infectious disease. If the Health Officer were to go and inspect the case, re-diagnose the disease, and perhaps reverse the decision of the practitioner, and put the whole matter on public record, it would be a professional outrage, a piece of personal presumption; in fact an official injustice. To send an Inspector to do the same thing would be at least equally reprehensible. The Board of Health will not tolerate any such practice on the part of its agents. The list of professional gentlemen in Detroit who have reported cases of diphtheria and other infectious diseases to the Health Officer, in obedience to law, embraces honored names, which are a guarantee of honesty, public spirit, skill in diagnosis, and medical ability. They will be treated with confidence and courtesy by the Health Department.

Henceforth it was understood by the Official City Physicians that they were sent to make a sanitary examination of the premises, and not to take supervision of the case under treatment. If a family employs a quack or ignoramus, who reports a case of sore throat as diphtheria, the sanitary authority cannot be blamed for acting accordingly. If they get their house needlessly placarded in such a case, they can blame themselves alone for employing such a doctor, or "person acting as such." Still the Health Department always reserves to itself the right to investigate a case of real infectious disease concealed either by ignorance or fraud. And the Board of Health acts as a court of appeal in case of disputed diagnosis between physicians.

The reports of the Sanitary Inspectors not infrequently give rise to additional orders to occupants or owners of the premises to clean vaults, fill up or drain low grounds, remove manure heaps or other filth; to empty and cleanse foul cisterns; to close up polluted wells; to overhaul defective plumbing; to make connections with the public sewer, for the purpose of safely removing slops, wash-water and other liquids, etc.; all of which pertains to another branch of the administrative sanitary work of the department. These reports will in time accumulate sufficiently to form the basis of some important statistical generalizations.

When a case of contagious disease terminates, either by death or recovery, the following order is issued to a competent officer, generally a young physician, trained to that particular duty, to disinfect the house:

Form 19.

OFFICE OF THE BOARD OF HEALTH,

DETROIT, ———, 188 .

To ——— ———

You are hereby directed to disinfect house No. — ——— street, in the family of ——— ———, where a case of ——— has terminated by ———, to deliver to the family the enclosed certificate, and to report herewith to this office.

By order of the Board of Health.

——— ———, M. D.,
Health Officer.

The disinfector, after completing his work, takes down the placard and delivers to the family the following certificate:

OFFICE OF THE BOARD OF HEALTH.

OFFICE IN CENTRAL MARKET BUILDING.

DETROIT, ———, 188 .

It is hereby certified that ——— ——— of ——— street, ——— Ward, has recovered from ———.

The house has been disinfected, and the inmates may again have the privileges of schools, library, etc., with safety to the public health; subject to the regulations of the Board of Education.

Placards can be removed from houses only by an officer from this Department, or by a written permit from the Health Officer.

By order of the Board of Health.

——— ———, M. D.,
Health Officer.

N. B.—Show this certificate to Principals of Schools, Librarian, etc.

The disinfector makes returns on the order, which is then filed with the other papers in the case. The record of the case is then completed on the infectious disease register, and the papers are all pinned together, numbered, indexed and put away for any possible future reference. The whole history of the case can be found in the Health Office, months or years afterward, on a minute's notice.

As soon as the card of the physician reporting the case comes into the office a notice is sent out by mail to the Principal of the public or private school where children from the infected house are in the habit of attending. A notice of every case is also promptly given to the Superintendent of Schools.

When a case terminates in death, the Undertaker who has charge of the burial of the remains receives special orders not to take the corpse to a church or other public place for a funeral, not to open the coffin at the private funeral, nor to allow young persons to act as pall-bearers. The enlightened clergy of Detroit have given efficient aid and moral support to these restrictions as to funerals in cases of death by contagious disease, to the very great sanitary benefit of the public.

Such are the elaborate measures taken to restrict the spread of infectious diseases, which in our great centres of population perpetually gather a rich harvest of victims. The labor is great, but I have no doubt that the results, if they could be accurately measured, would astonish the most thoughtful citizen.

THE ADVANTAGES OF THE SYSTEM MAY BE BRIEFLY STATED:

1. It enables the Health Department, and the public through the Health Department, to know every day in the year the exact number of cases of infectious diseases in the city and their precise location. Rumor and sensational exaggeration in regard to the prevalence of contagious maladies, which are liable to alarm the people needlessly and to interfere with the pursuits of life, can then be corrected by facts. And the truth of a violent epidemic cannot be suppressed in the interest of commerce to the criminal endangering of the outside world.

2. The exact percentage of mortality is constantly known, revealing the severity or mildness of an epidemic.

3. The system affords especial means of studying the conditions under which contagious diseases flourish, or to what extent they are influenced by sanitary surroundings.

4. It diminishes the spread of contagious diseases by protecting large congregations of children in schools from the presence of those bearing infection in their persons or clothes; by preventing exposure of the living at public funerals; by revealing to all who can see and read the places, where such diseases may be caught, and by destroying the lingering germs of contagion in sick rooms by means of thorough disinfection. My experience convinces me that a community will give a wide berth to small-pox, scarlet-fever or diphtheria if you will only let them know where it is. I have frequently seen quite small children cross over to the other side of the street when approaching a house on the door of which was placed a placard revealing the existence of contagious disease within. It is wicked to conceal from God's little ones the fountains of infectious suffering and death.

THE DIFFICULTIES OF CARRYING OUT THE SYSTEM ARE CONSIDERABLE, BUT NOT INSUPERABLE.

1. When the majority of educated physicians are ready to co-operate with the health authority in carrying out any reasonable system of protecting the public from contagious diseases, the negligence of many and the perversity of a few must be overcome by the unflinching execution of the law. To the credit of the profession in Detroit it must be said that no one has raised the question of fees for reporting contagious diseases to the Health Office. An unseemly discussion of that question in now going on in Great Britain. The medical practitioner depends upon the patronage of the public, and should be willing to do for the public at large a service that costs very little time and trouble, and is attended with no expense. The necessity of reporting to the Health Office all deaths, with the causes, in order to get a permit to bury, puts the doctor on his good behavior. A few attempts to return croup for diphtheria, spotted fever for scarlatina, etc., have been met with an order for a

coroner's inquest. Inability to make a diagnosis has sometimes been urged as an excuse by delinquent quacks, but an unmistakable indication of criminal prosecution soon revealed to them that the responsibilities of assumed knowledge cannot be avoided by a plea of ignorance. In some instances doctors have prematurely reported recovery. The law of duration in contagious diseases is too well known to allow such heedlessness to escape notice and rebuke. It is sometimes disagreeable to supplement the mental and moral defects of a portion of the profession by the terror of criminal law, but faithful sanitary administration requires it.

2. At first the people objected to having their houses placarded, as a violation of personal liberty. A little argument convinced reasonable citizens that no man has the natural or acquired right to expose his neighbors to deadly contagious disease by concealing it in his own house. Personal liberty to give small-pox to somebody else had better be abridged as soon as possible. Personal liberty to send scarlet-fever into a school with your child is rather diabolical than benificent. Personal liberty to infect a church with a diphtheria corpse is tempting Providence to start an epidemic. A law-abiding community submitted, and to-day the system of placarding, if it were left to an election, would receive a majority of votes in its favor. Experience proves its value in many ways to the citizen. He knows and feels that, by reason of it, his family is more secure against diseases that cost money, anxiety and sorrow.

THE DEFECTS OF THE SYSTEM ARE ALREADY APPARENT TO EDUCATED SANITARIANS :

1. So far as small-pox is concerned, proper vaccination and re-vaccination at suitable ages should be universal and compulsory. I am sorry to say that, in this respect, the sanitary code of Detroit is defective. Without vaccination, suppression of the disease allows the greater accumulation of material for the conflagration of an epidemic, that sooner or later may get under way and defy all control. Every escape from scarlet fever is a

positive gain, for susceptibility to the disease decreases with age. Diphtheria should be suppressed all the time, for one attack does not secure immunity in the future.

2. The efficiency of the system depends to a great extent on the willing or enforced co-operation of the medical profession. Just so far as the profession falls short of an ideal standard must the system fail to reach its ideal value, however well it may be administered.

The system in Detroit is supplemented, as it should be, by a pest-house, to which the sick with contagious diseases, who have no homes, can be taken. With an efficient system of placarding and isolation, it is more economic, more humane, if not safer, to leave patients who have homes under the care of their families and friends. However excellent a hospital and its service may be, households are unwilling to give up any of their sick members to be nursed by unknown hands in a strange place. To force away children from parents, from brothers and sisters, and parents from children and from one another, for the purpose of isolating infectious disease, exposes the public by transportation of the afflicted, diminishes the chances of recovery, outrages the unreasoning affections, and invades the sanctity of home. Sanitation must reckon with the unalterable instincts of humanity and restrain itself within the boundaries of reasonable endeavor.

Therefore, in my judgment, the isolation of contagious and infectious diseases in the family, which is the unit of our political society and Christian civilization, is wisest and best. After long administrative training we shall get the willing co-operation of households and their chosen physicians. The day will come when exposure of others to our diseases will be recognized as a crime, the punishment of which will be demanded by the public conscience.

In the meantime we must combat superstition, diffuse rational knowledge, and protect the people against pestilence by the simplest and most effective means at our command, winning confidence by patient, kindly instruction, only using repression and the lash of the law when we must.

For the prevention of infectious diseases we are sadly in need of intelligent and trained private endeavor, as a supplement to public sanitation. Would that the clergy, taking for texts the hygienic precepts of Moses, which have not been surpassed by the so-called revelations of modern science, might preach the gospel of cleanliness and thus open up to their people new avenues of godliness! Would that we had in every city a society of devoted men and women, like the order of the Red Cross, whose especial duty it should be to go into the by-ways, not far from their own doors, and save from the perils of contagion and filth a greater number who perish, year by year, in times of peace than ever die on the fields of battle in times of war! "Meanwhile," says the venerable Edwin Chadwick, the father of sanitation in England, "until justice is reclaimed for the administrative service in behalf of the public, as much as possible should be called for by appeal for voluntary effort. Of what this may do in preventing the spread of the ordinary foul-air epidemics, I will state the experience of a nurse of twenty years' practice, as a specialist in dealing with the most infectious and dangerous of them, namely, scarlet fever. Her chief practice was the common one in respect to all cases of the varied epidemics: to isolate the patient in a single room, the upper room if possible, and let no one else enter it; to so arrange as to keep the door and part of the window open in order to let a current of air pass through the room over the patient; to observe all the details of regulations as to the cleanliness of the patient and the articles of clothing and furniture and the removal of excreta, etc.; and as to her own personal protection, never to drink out of the same vessel that had been used by the patient, and to wash from head to foot twice a day with tepid water, and to change her clothes each day. With these precautions, she had never had a single case of the spread of the disease to a member of the family or anyone else during the twenty years, nor had she once contracted the disease herself!"

To which a pregnant paragraph may be added from Richardson: "By a few rules, in short, which all prudent and wise people may carry out in their own homes, the accidental perils of the seed-time may be kept from the homestead as easily as from the prison house. Let every man and wife be their own sanitarians, and make their house a center of sanitation. Let in the sun; keep out the damp; separate the house from the earth beneath; connect the house with the air above; once, nay twice, a year hold the Jewish Passover, and allow no leaven of disease to remain in any corner or crevice; let the house cleanse itself of all impurities as they are produced; eat no unclean thing; come back to the first fruits of the earth for food; drink no impure drink; wear no impure clothing; do no impure act; and all the good that science can render you is at your absolute command."

Father Chadwick sums up the whole matter, at the close of his bold and noble address before the Health Congress at Brighton last December, from which I have already quoted, in the following conclusions:

"That cases of small-pox, of typhus, and of others of the ordinary epidemics, occur in the greatest proportion, on common conditions of foul air, from stagnant putrefaction, from bad house drainage, from sewers of deposit, from excrement-sodden sites, from filthy street surfaces, from impure water, and from overcrowding in foul houses;

"That the entire removal of such conditions by complete sanitation and by improved dwellings is the effectual prevention of diseases of those species, and of ordinary as well as of extraordinary epidemic visitations;

"That where such diseases continue to occur, their spread is best prevented by the separation of the unaffected from the affected, by home treatment if possible; if not, by providing small temporary accommodation; in either case obviating the necessity of removing the sick to a distance, and the danger of aggregating epidemic cases in large hospitals—a proceeding liable to augment the death-rates during epidemics.

"The skillful and complete works of sanitation and the removal of the conditions of stagnancy and putrefactive decomposition, are the most efficient means of reducing the expenses of excessive sickness and death-rates."

PREVENTIVE MANAGEMENT OF SMALL-POX IN DETROIT.

"*In Europe, as in other countries, small-pox long constituted one of the greatest scourges of mankind. Not a decade passed in which the disease did not decimate the inhabitants in one country or another, or over great tracts of country; so that it came to be more dreaded than the plague. No matter how assiduously physicians labored to discover a method of treatment, none of them accomplished a result worthy of mention. The Arabian theories of the disease, requiring sweating and other remedies designed to drive out the poison, were the order of the day till the first half of the seventeenth century. These notions, which still linger in the minds of the laity, however, were first overthrown by the talented Sydenham, who replaced them by the cooling, antiphlogistic method of treatment which we still consider rational in its fundamental principles. Yet, as may be imagined, even this treatment was but a feeble weapon against the terrible enemy. With the introduction of the inoculation of variola, the great change first began in the history of small-pox. This was completed at a later date by Jenner's discovery of vaccination, and to-day the occurrence, intensity, and spread of the disease in different countries depend greatly upon the manner in which this eminently protective remedy is employed.*"—CURSCHMANN, IN ZIEMSSEN'S CYCLOPÆDIA.

PREVENTIVE MANAGEMENT OF SMALL-POX IN DETROIT.

A somewhat detailed history of the cases of small-pox that have occurred in Detroit, since I took charge of the Health Department, will be of interest as exemplifying the principles upon which its preventive management has been based. Some portions of this history will be especially instructive to those whose faith in the efficacy of vaccination may be wavering.

Vaccination, isolation and disinfection are the means upon which sanitarians must rely in combating this most dreaded of all diseases. The methods of using these preventives are of great importance. Not only diligence is required, but also accurate knowledge of the natural history, thus to speak, of this loathsome malady. Certain enumerated facts concerning it may be given to facilitate reference.

1. As a rule, small-pox manifests itself on the twelfth day, or thirteen times twenty-four hours, after infection. The most obvious subjective symptoms are fever, headache, backache (spineache), and nausea. Two days afterwards, or thirteen times twenty-four hours after taking the disease, eruption appears, at first in bright red pimples, with a hard, shot-like base, which in due time develope into vesicles, at first rounded, then depressed, or umbilicated, afterwards into pustules, which finally become scabs and fall off, leaving pock-marks. The object here is not to describe the disease, from a medical point of view, but to indicate certain land-marks, from a sanitary point of view.

2. The best pathologists regard small-pox as not contagious during the first two days of fever, headache, backache

performed, with reliable virus, it will overtake small-pox and at least modify it into varioloid, when resorted to within three days after infection. It is the sling of David with which the giant may be slain. So precious is this preventive that I cannot here refrain from repeating some things that I have written about it before. The arguments in favor of vaccination cannot be too often re-produced.

PUBLIC PROTECTION BY MEANS OF VACCINATION, OR, MORE PROPERLY SPEAKING, BY INOCULATION OF VACCINE SMALL-POX.

In comparison with the long ages of man's life on this planet, non-infectious vaccine small-pox, or vaccination, is a new thing. Sixteen years less than a century ago Jenner published his discovery to the world. Only eighty-four years have elapsed yet the most dreaded of diseases to which man is subject has already lost the greater part of its terrors. Against the inertia of indolence and apathy, against ignorance and superstition, against dullness and prejudice, against heavy conservatism and unreasoning tradition, the practice of vaccination has spread in a few decades over the whole civilized world, to the vast benefit of mankind.

A few salient facts and groups of facts will demonstrate to any rational human being the immeasurable utility of vaccination, or, in other words, of inducing, by inoculation, non-infectious vaccine small-pox.

a. The great mass of people in all enlightened nations have come to believe in it, from observation and experience. *Vox populi, vox Dei.* Enlightened public opinion is a very good, although not infallible, criterion of truth.

b. Educated medical men are almost unanimous in favor of vaccination. Simon addressed a question, "purposely construed to elicit the expression of every existing doubt on the protective influence of vaccination," to 542 distinguished medical men, British and foreign, and received an affirmative answer from all but two of them. The British Epidemiological Society published a report of its small-pox and vaccination committee, in 1853, wherein reference is made to favorable answers from more than 2,000 British medical men, besides many in other countries. In America to-day, as well as in other countries, the physicians who do not favor vaccination are exceptions to the general rule.

c. The governments of nearly all civilized nations favor vaccination, and some of them make it compulsory. The British and German governments, both of them conservative and enlightened, require it. The Legislature of nearly every State in this Union has enacted a law favoring it.

d. Statistics on a large scale demonstrate the utility of vaccination. In Moravia, Bohemia and Austrian Silesia, vaccination reduced the annual mortality of 4,000 in every million of population, by small-pox, to 200. In Westphalia, where the death rate from small-pox was formerly 2,643 in the million of population, the annual mortality from the same cause declined to an average of 114 in the million from 1816 to 1850, under the influence of general vaccination. From 1810 to 1850, the yearly death rate from small-pox in Sweden was 158 per million of population, but was 2,050 before vaccination. In Berlin the reduction was from 3,422 to 176; in Copenhagen, from 4,000 to 200. At the close of the last century the estimated rate in England was 3,000. The average rate of 1841–53 was 304. The average of 1854–63, embracing two severe epidemics, was 171 per million of population. Yet there are men, apparently rational, who denounce vaccination, without suspecting that they are making themselves public malefactors.

e. Special statistics demonstrate the benefits of vaccination not less strikingly than general statistics. Dr. Seaton and Dr. Buchanan, both of them skilled observers, examined, in various London schools and workhouses, during the epidemic of small-pox in 1863, over 50,000 children. A large majority of them had been vaccinated in various ways and degrees. Three hundred and sixty out of every thousand who had not been vaccinated were scarred with small-pox. Less than two in 1,000 of those who showed evidence of vaccination had small-pox marks. Only one in over 1,600 who had perfect vaccine marks showed pitting from small-pox. Mr. Marson observed and carefully recorded 30,000 cases of small-pox under his personal care in the London small-pox hospital. Deaths among the unvaccinated were 37 per cent.; among the vaccinated, 6½ per cent.

The general drift of statistics on the subject, collected during the current century, is in the same direction. I have no doubt that the present epidemic of small-pox in the United States would be quite as calamitous as the great war of the rebellion, without the protection afforded by vaccination. Were the protection as perfect as it might have been, we should scarcely know of the existence of small-pox.

DEGREES OF PROTECTION BY VACCINATION.

Efficient vaccination, that is, vaccination with pure virus and properly performed is, in my judgment, just as complete protection against small-pox as an attack of the disease in the natural way. "Duly and efficiently performed," said Jenner, "it will protect the constitution from subsequent attacks of small-pox as much as the disease itself will. I never expected it would do more; and it will not, I believe, do less." Nature does her work perfectly. The element of art enters into vaccination, and the degree of its success depends upon the material used and the skill of the operator. The best vaccinator cannot produce good results with imperfect matter. The best virus may fail in the hands of a bungler. If such grand results in favor of vaccination, as already presented, are attained by work that is imperfect, what might we not expect with the science, skill and pains which are surely within human reach? Failure of vaccination may involve consequences more dangerous to the individual than the amputation of an arm. Yet we seek a careful and skilled surgeon to perform the latter operation, while any blunderhead is supposed to be capable of performing the former. The surgeon is contented with only the best instruments and dressings when he undertakes a capital amputation. Yet, when he undertakes to protect a fellow-being against a disease, which, taken in its natural form, kills four out of ten of all who have it, he sometimes uses any kind of a knife, and exercises less care in the selection of virus than he would in the choice of a sleeve button. As pointed out in one of the reports of the medical officer of the British Privy Council, the degree of protection afforded by vaccination varies as one to thirty. And the worst of it is, that slovenly vaccination, with imperfect or worthless virus, brings the great and beneficient discovery of Jenner into disrepute.

In the light of these preliminary statements of facts about the disease and the principles governing its management, it will be easy to understand the significant features in the history of

INDIVIDUAL CASES OF SMALL-POX.

When I took charge of the health department of the City of Detroit, there was a case of small-pox in the Laubenthal family, No. 162 Ontario street. The case had been removed from 75 Napoleon street, where the disease had previously existed. Several children in the Laubenthal family were vaccinated and removed to the house of a relative. The mother of the young man, who had had the small-pox, remained in charge of him. Children all escaped at that time. The patient died on the 12th of October. The house was disinfected by one of the official City Physicians, who had charge of the case. Although the house was in a densely packed neighborhood, the disease did not spread to any of the surrounding people.

The next case was that of a child six years of age, in the same family. It is supposed that the child contracted the disease by playing in a pile of straw which had been emptied from a bed on which the previous patient had died, into the yard, and there unaccountably neglected. The case was reported to the Health Office on the third of December. Recovery was reported on the twenty-seventh, and the next day the house was thoroughly disinfected, which was the end of the disease at that place.

The next case that occurred was that of Maynard, aged twenty-five years, at 413 Fifth street, reported by Dr. Reynolds. The family consisted of the mother and four children, besides the patient. The case was reported early, on the first appearance of the papular eruption. The mother and a sister remained in care of the patient. The rest were sent away to the houses of relatives and ordered to report to the Health Office every other day. Young Maynard died on the thirty-first. The mother and sister in charge of him were protected by vaccination, and escaped unharmed. Vaccination was working while they were in attendance upon the dying son and brother. All the rest of the family escaped, whether by vaccination or early removal from the presence of the disease, it is impossible to tell. Maynard is supposed to have contracted the disease from emigrants, whom he was in the habit of visiting as they passed through the city. Small-pox in this case was confined to its one victim. The house was abandoned by the family and thoroughly disinfected with chlorine gas.

The next cases occurred January 5th, 1882, in the family of Porath, 595 Twenty-third street. A little girl aged four years and a young woman of eighteen were reported on that date by Dr. Lang. Two days afterwards the father was also reported as sick with the disease. The father died on the fourteenth, and the others in due time recovered. The mother had been well vaccinated in Germany, and escaped. An older sister was supposed to have previously had varioloid. The cases were carefully watched by the Health Officer, and a little sulphur burned in the house every day. The premises were completely isolated, and the disease did not spread from that point. Here, as elsewhere, the neighborhood was officially visited, and all unprotected persons were well vaccinated. In the adjoining house, separated only by a partition, a child was born at the very time Porath was dying with small-pox. Both the mother and the little one escaped unharmed.

About the same time an unknown tramp at the Central Police Station broke out during the night with small-pox. He was immediately sent to the County pest-house at Wayne. Nobody was infected at the station-house, for the simple reason that the patient was removed during the earliest stage of papular eruption, before the disease had become infectious.

Also, about the same date, a sick tramp, named James Alback, sent over to St. Mary's Hospital by the authorities of Windsor, broke out with the disease and was removed to the Wayne County pest-house before any harm was done. The man died a few days afterwards with confluent small-pox. This and the previous case show the great value of early diagnosis and prompt removal.

On the eighth of January, the case of Mary Sullivan, a child of three years, was reported by Dr. Thuener, in a tenement house at 205 Franklin street. The mother had recently returned with the child from Chicago. The house was placarded and over twenty inmates vaccinated. As yet there was no pest-house, and the case had to be taken care of at home, in a pauper family, as best it could. On the twenty-eighth, Nellie Sullivan, aged fourteen years, in the same family, came down with small-pox. The pest-house then being in readiness, the two cases, together with the mother of the child, were removed there. The house was very thoroughly disinfected, and fortunately the disease spread no farther in that quarter. For several days three men and four women were shut up in two small rooms of the tenement house with the sick child. Two of them were protected by previous attacks of small-pox, and recent vaccination saved the rest. It required very constant vigilance to prevent going and coming from the premises.

On the first of February, the case of Mary Waters, a girl fourteen years of age, was reported by Dr. Gardner, at 241 National avenue. The girl had been away at service and returned home very ill. The case was discovered at the earliest period of papular eruption, and was taken charge of by the Health Officer. It is unknown where the disease was contracted. The family consisted of father and mother and eleven children, in straightened circumstances. More than half of them were unprotected by any kind of vaccination. The mother consented that the daughter might be removed to the pest-house, upon condition that she be allowed to go along. They went without delay. The case was a severe one, but recovered in about four weeks. The mother had a very sore arm from fresh vaccination, but escaped otherwise unharmed. The family at home were all vaccinated and escaped.

On the seventh of February, the case of a boy, twelve years of age, was reported in the Kellog family by Dr. Jamieson, at 103 Beach street. The mother would not allow the boy to be removed to the pest-house alone, and could not go with him and leave her husband, an epileptic old man, at home. An older brother, Henry Kellog, had been exposed to the disease and was running at large in the city. The Health Officer, with a great deal of trouble, hunted him up, put him under quasi arrest, and removed him on the fourteenth to the pest-house, fortunately catching him just as he was first breaking out, before anyone was endangered. It was supposed that the origin of the disease in this family was from an older brother who had been concealed in the house with a mysterious attack of chicken-pox, which he had contracted during a journey to Chicago. Although this habitation was in a row of wooden tenement houses, the disease did not spread from it, except in one pathetic case which will be described farther on.

The next case was that of Fred J. Utzelman, a young man twenty-four years of age, reported on the eleventh of February, by Dr. Stevens, on the corner of Magnolia and Eighteenth streets. He was recently from the country, and could not tell where he contracted the disease. He was removed to the pest-house and rapidly recovered, as the attack was light. The family in which he boarded and where he was taken down consisted of a man and his wife and several small children. They as well as the neighbors were immediately vaccinated. No other case arose from this one.

On the fourteenth of February, Richard Gould, twenty-one years of age, was removed from the Marine Hospital to the pest-house with small-pox. He had come from Chicago two weeks previous. The case was very severe. He died on the twenty-fourth. Early removal, or vaccination, or both, prevented any further cases at the Marine Hospital.

On the same day the case of James Sickner, a young man nineteen years of age, was reported by Dr. Law, at 347 Michigan avenue. As the family consisted only of the father and mother, besides the patient, the case was isolated at home. Young Sickner speedily recovered under the efficient nursing of his mother. On the twenty-sixth, his father, James Sickner, sen., was taken down with a very light case of varioloid and recovered in a few days. This family have been employed for some time as nurses at the pest-house, and have been doing good service for the public. There was no spread of the disease from that locality. The origin of it could not be traced.

On the twenty-second of February, the keeper of the Tremont House, corner of Second and Front streets, collared a young man named Wm. Smith, who had come into the bar-room for a drink, shut him up in a vacant room and sent for Dr. Barclay, who diagnosed incipient small-pox. The keeper of the house had had small-pox himself, and, fortunately, had a sharp eye for the disease. Smith was removed to the pest-house then and there, before he had communicated the loathsome malady to anyone else. He had no friends; speedily recovered, and was sent on his way again in the great world. He was something of a vagabond, and could not tell where he got the disease.

On the seventh of March, Dr. McGraw reported the case of Captain J. A. Sloan, at 753 Fourth street. The captain had returned from Chicago about two weeks previous. As the family only consisted of himself, wife and servant, he was isolated at home. Mrs. Sloan and the servant girl were protected by vaccination, and the disease did not spread from that focus.

On the same day Mrs. Armstrong, of 101 Beach street, came to the Health Office and said that she had a sick child at home which she wished the Health Officer to see. A physician had seen the case the day previous and pronounced it to be pneumonia. Mrs. Armstrong said she was not satisfied with the diagnosis, and feared it was something worse. The Health Officer went with her and found a case of incipient small-pox in her little boy George, not quite three years of age. Next door was the Kellog house, the cases in which have already been described. A dog belonging to the Kellog's was continually running into the house of Mrs. Armstrong, and her little boy was in the habit of playing with it: No doubt the child contracted small-pox from the thick hair of the dog, which was saturated with the atmosphere of the house where it belonged. Mrs. Armstrong consented to go with her little boy to the pest-house, upon condition that she be allowed to take her nursing child with her. The three were removed that day. Little George never returned. The mother and the nursling, who were carefully vaccinated when they went, escaped unharmed. Several other members of the family also escaped, who were left at home, and the disease spread no farther from that house.

On the sixteenth of March the case of litttle Addie Potter, three and one-half years old, was reported by Dr. Brown, at 260 McDougall avenue. The family consisted of ten persons, in straitened circumstances. At first it was a mystery how the child had contracted the disease. After diligent miscellaneous inquiries it was ascertained that the father, in the exuberant benevolence of conviviality had invited to his humble home an old tramp who doubtless had the disease in his beard and clothes, from mingling with infected persons of his kind in some of the by-ways of the world. The worthless vagabond remained in the Potter family a couple of days, and especially petted poor little Addie, who would sit upon his knee by the hour and lay her little head upon his breast. Such was doubtless the source of the pestilence with her. Mother and child were removed to the pest-house. The rest were vaccinated and isolated at home. In two weeks Addie died. The same day the baby, left at home in care of the father and the older children, was taken down and removed to the mother in the pest-house. It had been repeatedly vaccinated without success. It had a long and severe illness but survived. After six weeks of distressing sojourn in the pest-house the mother returned home unscathed with the disease, entirely protected by vaccination, to find the rest of her family safe and well. The neighborhood, as usual, were carefully vaccinated, and the disease spread no farther in that quarter.

March seventeenth, Mary Campbell, a servant-girl in the house of Mr. Wetmore, at 452 Jefferson avenue, was reported by Dr. Stewart. She had recently come from Canada. Without delay she was removed to the pest-house, where she speedily recovered after a brief illness. Vaccination and disinfection prevented the disease from spreading in that quarter.

Elsie Von Blumen (a pseudonym for Cora Kiner), the byciclist, was taken down with varioloid at the Franklin House, on the twentieth of March, and removed to the pest-house. The case was very light and she soon recovered.

On the twenty-eighth day of March a young man named John Cook, twenty-two years of age, recently from the country, was taken severely ill at a large livery stable, where he was working as hostler. The owner of the stable removed him to St. Mary's Hospital, where he was refused admission upon the ground that the disease might prove to be contagious. The Health Officer was then called in, who diagnosed small-pox from subjective symptoms, and, although eruption had not yet appeared, removed him to the pest-house. He died on the sixth of April, nine days afterwards, from a very virulent form of confluent small-pox. Nobody took the disease from him.

On the third of April, Mrs. Freedman, wife of the keeper of the Franklin House, was also taken down with varioloid and removed to the pest-house. She, as well as Miss Von Blumen, had probably contracted the disease from a fellow who was assistant agent of the latter, and is reported to have had an attack of varioloid just previous to his arrival in this city from Cincinnati. Mrs. Freedman's mother went with her, to take care of her at the pest-house, and escaped unharmed, protected by fresh vaccination. The disease spread no farther in the hotel. All the employés and inmates were carefully vaccinated.

Dr. Spranger, on the twenty-third of April, reported the case of Albert A. Fish, at 154 Pitcher street. Mr. Fish was isolated at home, with his wife as nurse. The case was light and soon recovered. The wife was protected by vaccination, and small-pox counted no new victims in that neighborhood. Mr. Fish thinks he contracted the disease from an itinerant salesman who was in his place of business.

On the twenty-eighth of April, Dr. Kaiser reported the case of R. M. Mott, 174 Adams avenue east. Mr. Mott was isolated in his own house, with his wife and another lady as nurses. The case was light varioloid and the patient soon recovered without any spread of the disease. Mr. Mott, being a clerk in a hotel, was of the opinion that he contracted the disease from some traveler.

May sixth, Dr. Wyman reported the case of a young child of Doyle, No. 952 Congress street east. The case was severe and the child died on the eighteenth. The father contracted varioloid from the child and recovered after a brief illness. The origin of the disease in the Doyle family is supposed to have been from a visit to friends in Illinois. The unprotected among the neighbors were vaccinated and the small-pox was there confined to the Doyle house.

On the tenth of May, Dr. H. R. Mills, of Port Huron, sent from that place one Michael Huntzinger to the Marine Hospital in Detroit, by railroad. Huntzinger was a seafaring man, taken on board the propeller Roanoke two weeks previous at Chicago. He made the voyage to Buffalo and was returning on the same boat to the upper lakes. He was taken sick on the ninth and was put ashore by the captain of the Roanoke at Port Huron. The next morning, the morning of the tenth, he was broken out with the small-pox, and Dr. Mills sent him to this city and gave no warning of his coming until he was on board the cars. The surgeons of the Marine Hospital, to whom Mills had telegraphed a wrong hour for the arrival of the train, missed the man at the station. The patient broke out of the car and got loose in the city. He was not captured by the Health Officer and Police until near morning. He is known to have been on the street-car, in several, saloons, and in a hotel. About daylight, on the eleventh, he was landed in the pest-house, after having exposed an unknown number of persons. It has been a long and severe case of confluent small-pox, from which the patient, however, has recovered. He is still at this writing, (June fourteenth), in the pest-house, too weak to be removed.

On the twelfth of May, Hedwig Handloser, an emigrant woman, just arrived, was discovered on Woodward avenue, broken out with small-pox. She was overtaken at a German Hotel, on Larned street, and immediately removed to the pest-house, where she soon recovered. The inmates of the hotel were vaccinated, and it cannot be learned that anyone took the disease from her.

On the nineteenth of May, Dr. Halsey reported the case of Mary Francis Wright, a girl who recently arrived from Canada, at 306 Fifth street. The girl was immediately removed to the pest-house in the earlier stage of papular eruption, where she recovered after a mild attack of varioloid. Early removal and vaccination protected the neighborhood.

On the twentieth day of May, Dr. Boyce reported the case of Frank Gamble, a man thirty-two years of age, at 21 Chase street. The case had already become decidedly infectious. He was removed to the pest-house the same evening, together with his wife and a young girl employed in his family, who had been especially exposed. The wife and girl were vaccinated on both arms at the time of the removal. Gamble died on the twenty-sixth with confluent small-pox. The vaccination of the girl and wife took well and they were released from the pest-house on the seventeenth day after their arrival there, perfectly safe and sound. How Gamble contracted the disease is unknown, unless it was from the effects of a relative arriving at his house from Chicago two weeks previous. There has been no spread of the disease among the neighbors. The preservation of Mrs. Gamble and the young girl, who accompanied him to the pest-house, by vaccination, is especially remarkable.

On the twenty-second of May, Mathew Shea, a poor laborer, forty-five years of age, living in the alley between Third and Fourth, Abbott and Porter streets, was reported by Dr. La Ferté as sick with small-pox. The case had already advanced to the infectious stage. Shea was removed to the pest-house without delay, the family were vaccinated and the house was thoroughly disinfected. He died on the twenty-seventh with a virulent form of the disease. A few days afterwards the youngest child of Shea, who had slept with the father during the first days of his illness, on whom repeated vaccination had not taken, was seized with the same disease. The following, cut from a newspaper, tells the sad story of this child: "The Shea child, taken last Friday in the arms of Health Officer Wight to the pest-house, died last night and was buried in the consecrated ground of Mount Elliott cemetery, next its father, who died at the pest-house last week. Dr. Wight feels very sad about this case. The little fellow on his way to the pest-house kept singing, in his delirium, with plaintive, infantile voice, "Gee up, Dobbin!" The Health Officer called him "Little Dobbin," and directed everybody in the house to be good to him. The mother has just been taken down with the same disease, and she will be removed this afternoon to the pest-house." Two little girls were taken to the pest-house with the mother. At this writing they are still well and the mother is recovering. There has been no spread of the disease as yet in that densely populated and filthy neighborhood.

On the twenty-sixth of May, Dr. Henderson reported the case of John Farnan, twenty-two years of age, at 200 Baker street. The disease was in its earliest stage, and two sisters and a brother were vaccinated and sent to another house, leaving the patient and his widowed mother isolated at home. The case is now fully recovered without communicating the disease to other members of the family or to the neighborhood.

On the thirtieth of May, Dr. Willard Chaney, one of the official City Physicians, who had been in attendance on small-pox in the family of Doyle and at the pest-house, came down with a light attack of varioloid. The doctor set a good example to the people by going voluntarily to the pest-house, where he rapidly recovered.

On the fifth of June, little Carrie Burrington, three years of age, at the Bernard House, was reported by Dr. Eaton as sick with some suspicious eruptive disease. The Health Officer visited the patient and found a striking case of confluent small-pox, already in the infectious stage. The mother and child were immediately removed to the pest-house. Poor little Carrie died on the eleventh. The mother remains at the pest-house, as yet perfectly well. The inmates of the hotel have been carefully vaccinated, and it is hoped the disease will spread no farther. The origin of the disease at that place is supposed to have been from some traveler stopping at the hotel.

On the sixth of June, Dr. Morse Stewart, Jr., reported the case of William O'Connor, aged forty-six years, at 209 Congress street east. It was very light varioloid. The case recovered in a week, isolated at home, and the house has this day been disinfected. Whether the small-pox will spread from that place is as yet unknown.

Such is the complete and detailed history of small-pox in the City of Detroit, from October 3d, 1881, to June 15th, 1882. Although the city is in the line of the great emigration movement, although the disease has been epidemic all over the country, and although other centers of population have suffered severely, we have escaped most remarkably. What the future has in store for us is more than we can tell. It behooves us to prepare for the worst. As I have said elsewhere, it must not be forgotten that millions are born into the world every year, who are liable to have small-pox in the natural way. Although miscellaneous vaccination performed with varying degrees of skill, with virus furnished by commerce, subject to the temptations of commerce, costs the aggregate of individuals in the community a good deal more than an effective State system would cost in taxation, the practice, in the meantime, must be encouraged, and such other instrumentalities must be used as experience has proved to be useful. Of course, cases must be reported to the sanitary authority as soon as suspected. Isolation is of great value. A large card on a house, announcing that the disease is within, is very effective, for the simple reason that everybody is afraid of small-pox, and will avoid it when its location is known. Intelligent, thorough, pains-taking disinfection of the place, after the disease, is essential.

HOSPITALS FOR CONTAGIOUS DISEASES.

The word pest-house is certainly suggestive enough, and with it are associated many real as well as imaginary horrors. It would be a good thing if use of the term were dropped by general consent. A real hospital, a *hotel-Dieu*, a God's inn, for wise and humane care of the homeless and friendless who are suffering and helpless with small-pox, ought to be attractive instead of repulsive, to those in need of the charity which it offers. Until universal vaccination shall thoroughly protect the public against this disease, it is incumbent on every community that is thoughtful of its own safety, to provide such an institution and have it always in a state of readiness.

It is easy to procure and pitch hospital tents in summer, but epidemics of small-pox generally come in winter. In country places and villages, it is not difficult to find an isolated building for a temporary hospital. In cities, the location of a pest-house, even for a brief period, is frequently attended with extraordinary difficulties. The Board of Health in Detroit has had some experience of this kind during the present season.

A permanent small-pox hospital for a city, so located as to be easily accessible, so constructed as to be safe in a populated neighborhood, so arranged as to afford healthful conditions to its inmates, so planned as to secure isolation, so administered as to be a real home to unfortunates, is a thing ardently desired, but not yet realized. After thinking over the matter a great deal, I have become convinced that the best way is to make suitable provision for the future without delay.

The views of the Board of Health, as to the impracticability of using the pest-house built at Grosse Point, have already been communicated to the Common Council:

1. The average distance from all parts of the city to that pest-house is seven miles. To remove a patient sick with small-pox such a distance in an ambulance, at a season of the year when the roads are rough and the weather inclement, the very time when the disease is most likely to prevail, increases the patient's danger.

2. The road to the pest-house is the most frequented of any leading in to the city. The Controller and the Health Officer met about 150 teams on their way to visit and inspect the institution a few weeks ago. It is unpleasant and dangerous for people coming to the city and contributing to its business prosperity to meet a small-pox ambulance on the road.

3. The highway in that direction is lined with habitations, the inmates of which would regard themselves as exposed by the transportation of a small-pox patient along the street.

4. The pest-house is so far away from the city that medical attendance and proper administration would be very expensive, while proper supervision and constant communication would be almost impossible.

5. The surrounding population of Grosse Point are exceedingly hostile to the pest-house, and threaten to burn it down.

6. The distance is so great from the headquarters in the city that the Metropolitan Police could not be promptly and effectively used to protect the institution and its inmates.

7. While authority has been given by the Legislature to he city, in the charter, to maintain a hospital outside of its

limits, the question arises whether a pest-house is fully embraced in the term hospital, and the further question presents itself, whether the city has a right to transport contagious disease through another thickly inhabited jurisdiction in order to reach the pest-house. These questions might lead to unpleasant and expensive intermediate litigation, even if they were finally settled by the courts in favor of the chartered authority of the city.

8. All these difficulties would be likely to lead to such a dread of the pest-house in the public mind, that great pains and risks would be taken to conceal cases of small-pox, thereby increasing the danger of the disease to a greater degree than the enforced use of the pest-house would decrease it.

Therefore, I respectfully recommend the Common Council to empower the City Controller to dispose of the property at Grosse Point, and apply the proceeds thereof to the construction of a small-pox hospital on any suitable piece of land owned by the City, under the direction of the Board of Health. After consultation with a very eminent architect in Detroit, I have been strengthened in my conviction that the best plan to be adopted is, as I recommended in a paper read before the State Sanitary Convention, at Ann Arbor, in February last, that of

A FLAME-VENTILATED SMALL-POX HOSPITAL.

Around a central octagon, construct four other octagons of the same dimensions as the central one. There will then be five octagons in the general form of a square. Of necessity, there will be four intermediate spaces, on opposite sides, between the four external octagons. A single line will enclose each of these intermediate spaces, making a square of each, the length of the side of which will be the same as the length of the side of the octagon.

Suppose the length of line chosen is twelve feet. There will then be four external octagon rooms, or wards, about twenty-eight feet in diameter, and four small rooms, or isolating wards, twelve feet square. Let the height of ceiling be fifteen feet. Each octagon ward will then have about 10,000 cubic feet of air space, and each square room about 2,000. Each of the octagon wards would be large enough for five patients, giving to each the regulation 2,000 cubic feet of air space, and 144 square feet of floor space. The small square rooms would be equally sufficient for one patient each. Such a building would be ample for twenty-four patients, without the central octagon, which might be divided into four large bath rooms, with necessary accessories. In case of pressing need, thirty patients might be put into the building, still giving to each as much cubic air space as the famous Herbert Hospital of England affords.

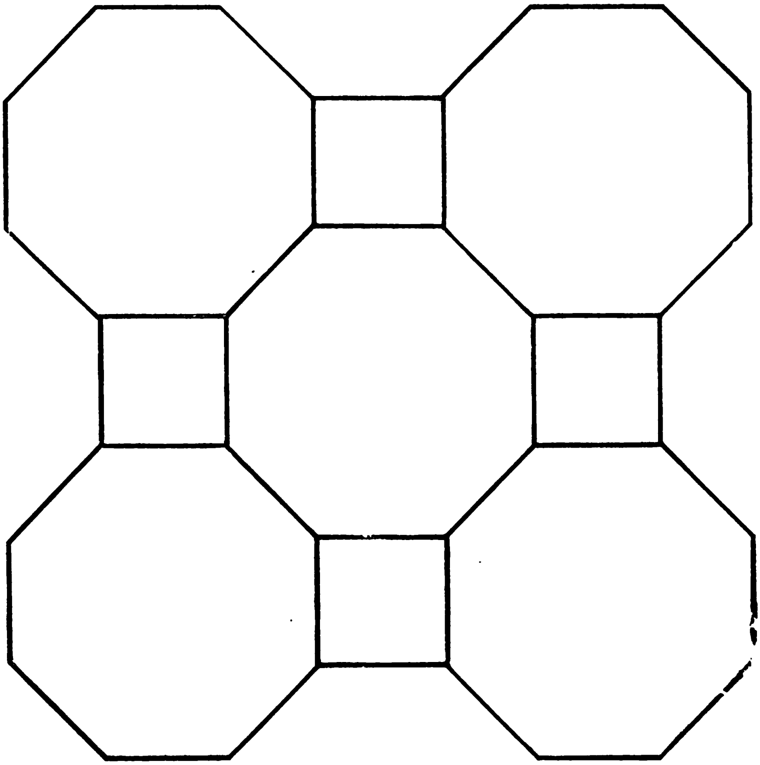

Diagram of a Flame-ventilated Small-Pox Hospital.

It will be perceived that the structure is limited to one story. In the light of existing knowledge and experience, it would be positively wicked to construct a contagious disease hospital more than one story high.

What are the advantages of such a form?

1. Each of the wards can be ventilated by an iron pipe, running from the centre of the ceiling up through the roof, in the lower end of which a flame of gas, or of some other material, may be kept constantly burning. A twelve inch pipe going up from the centre of the ceiling in the octagon would cause an entire change of air in the room every forty minutes, provided the movement of air in the pipe were five feet per second. A much greater velocity might be gained by letting in a larger supply of air from the outside. A complete change of atmosphere in the ward once in forty minutes, would give each patient the regulation 3,000 cubic feet of fresh air per hour. A six inch pipe would do the same service for each of the small square rooms.

The constant flame in these ventilating pipes would not only cause a strong draught upwards, but would consume every particle of contagion in the air from the infected rooms. The constant strong upward draught would cause a perpetual inward movement of fresh air through every crevice, open window or door. No contaminated air could escape from within to poison the outside atmosphere. There could be no accumulation of infection in the wards, for the contagious germs would be reduced to harmless oxyds as fast as generated from the patients. With proper arrangements for disinfecting and washing clothes and bedding, such a flame-ventilated hospital would be safe in the centre of a large city.

2. The walls of the structure could be made very light, and yet be very strong; for there would be no length of line over twelve feet, and all the sides would be mutually supporting. The thinnest hollow wall would be sufficient. The whole structure could be made fire-proof at a minimum cost.

3. The form of the structure is such that none of the larger

wards could be entered except through two doors, which should be made self-closing by means of springs.

4. Each of the wards has an adjoining room in which a delirious patient might be confined, or a patient about to die might be placed away from the others. It is very distressing and injurious to the sick, to witness the death of a fellow-sufferer in their midst.

5. The form of the building is such that a small portion of it can be conveniently and economically occupied by a small number of patients.

6. The form of the structure is such that you can add to it indefinitely, without at all changing the plan, or interfering with the occupancy of the part already built.

7. A separate roof can be constructed most cheaply over each section of the building, thus making it picturesque and ornamental.

8. The structure is compact, without excluding sun-light and air.

9. In the main wards there are no sharp corners for the collection of foul air and contagion.

10. The facilities for separating different classes of patients are unequaled.

11. If for any reason it should be found desirable to destroy a portion of the building, a piece could be taken out without disturbing the rest.

12. Any ward in the building could be disinfected, even with chlorine gas, while the other wards were occupied.

13. The roof over each room being separate, there would be no-continuous blind attic to convey the foul gases of water closets throughout the whole building.

14. No fire-proof building for the same number of patients could be constructed so cheaply on any other plan. Such a building as here described for twenty-four patients, could be erected, with tile floors and slate roofs, for $4,000. It must not be forgotten that each patient is to have 2,000 cubic feet of air space, 144 square feet of floor space, and 3,000 cubic feet of

fresh air per hour. In addition to which, the contagium is to be consumed by flame as fast as generated.

This kind of structure for a city may be placed in the center of a square, surrounded by a high fence along the streets on the four sides, so that there will be no access to the hospital except through a two-story administration building in front, which should contain a dispensatory, reception room, kitchen, and sleeping rooms above for nurses when off duty. In rear of this, should be the boiler-room, and near by the hospital should be the laundry, containing proper apparatus for disinfecting with super-heated steam.

If a larger hospital were desired for a larger city, a group of ten octagons in form of a parallelogram, four long, two wide, two central, with eight intervening square rooms for isolating delirious or moribund patients, ample for the care of forty-eight infected persons in the best manner, sufficient for seventy-five in case of special need, even then giving to each 1,500 cubic feet of air space, could be constructed of fire-proof materials for a maximum cost of $12,000, including a good two-story administration building, boiler house, laundry, heating apparatus, etc. It could be disinfected, even to the bricks in the walls, with chlorine gas, and be safely used for cholera, scarlet fever, diphtheria, typhus fever, or other epidemic disease, in the absence of small-pox. Private residences infected with small-pox are not burned down, but are safely inhabited, even after ordinary disinfection.

Recurring to the most important means of combating small-pox, I cannot better conclude a discussion, somewhat lengthy, but not by any means exhaustive, than in the words of Dr. Henry Tomkins, Medical Superintendent of the fever hospital belonging to the Manchester Royal Infirmary at Monsall, in a paper recently read at Owens College:

"The most striking of all evidence is, perhaps, that derived from the small-pox hospitals themselves. Here the protective influence of vaccination is seen and proved in a manner beyond all cavil. At Highgate, during an experience of forty years, no nurse or servant having been re-vaccinated has ever contracted disease, and evidence of the same character I can myself bring forward, for during the whole time that I have had charge of the fever hospital more than a thousand cases of small-pox have passed under my care, yet no servant, nurse, porter, or other person engaged there has, after re-vaccination, ever taken it, though exposed daily to infection in its most concentrated form. * * Again, among all the students who during the past two years have attended the hospital for clinical instruction, not one has suffered, all having been re-vaccinated before being permitted to enter the small-pox wards. * * * I defy the most enthusiastic or conscientious of anti-vaccinators to produce evidence like this on his side of the question, or to bring forward even half a dozen persons, choose them whence he may, who have not been protected against small-pox, and expose them as the students are exposed, without more or less of the number taking the disease. Facts such as these should convert the most ardent anti-vaccinator from his folly, and convince him that a weapon of defense so powerful as vaccination should not be left to the pleasure of the individual, but that the State has the right and duty to look after its most thorough performance."

THE PUBLIC SEWERAGE AND HOUSE DRAINAGE SYSTEM OF DETROIT.

"*A separate system of sewerage is necessary where cellars are so low that they must be drained by pumping, and where the cost of a combined system cannot be afforded; that its economy is always very great; that it is entirely efficient with a fall of one in five hundred; that surface-drainage can be prevented from causing inconvenience or damage worth considering, no matter what the size of the town, for an outlay which compared with the extra cost of a system of combined sewers would be trifling; and last and most important, that while combined sewers cannot possibly meet the necessary sanitary requirements, separate sewers can be made absolutely safe, affording the only means now known for the perfect sanitary drainage of a town of any size, and that for these reasons the separate system is always advisable.*"—GEORGE E. WARING, JR.

THE PUBLIC SEWERAGE AND HOUSE DRAINAGE SYSTEM OF DETROIT.

Dr. Buchanan, in England, and Dr. Bowditch, in the United States, simultaneously demonstrated that the wetness of soil is at least the exciting cause of phthisis. Surface accumulations of water are not only inconvenient and unsightly, but also disagreeable and unhealthy. Sub-soil dampness makes the site of any habitation incompatible with comfort and duration of life. Therefore, the first care in the preparation of the abodes of man, and, it might be added, of domestic animals, should be the drainage of the soil. Removal of water from beneath and around the house and outbuildings increases warmth, fertility, and wholesomeness. What is true in this respect of an isolated habitation, is also true of collections of habitations in the village, and groups of villages constituting the city.

Whatever engineering device is employed for draining the soil and removing rainfall should be used exclusively for the conveyance of water uncontaminated with putrescible organic matter. Such water may then be safely discharged into any convenient natural reservoir, or adjacent stream, where economy and security from flood may dictate. For removing storm water, surface water, and sub-soil water from the isolated habitation, neatly constructed ditches, agricultural tiles properly laid, and occasionally deep drains of porous brick will be sufficient. In villages, well-paved gutters, with more frequent and larger deep drains of porous brick will be needed. In cities, brick mains, adapted in size to the areas from which the water is to be removed, must be added. A suitable size for the site of an isolated habitation, with its outbuildings, in the country, may be regarded as about three hundred feet square. The annual rainfall on that area, at the fair estimate of thirty-six inches, would amount to 270,000 cubic feet. The annual rainfall on a square mile, the average size of a village, would be nearly 84,000,000 cubic feet. On ten square miles, the area of a considerable city, the annual rainfall would be more than 836,000,000[1] cubic feet. On a city of ten square miles more than 20,000,000 cubic feet of water may be precipitated from the clouds in a single hour. These figures show that the drainage system of inhabited places should be adequate, as well as adapted to the desired end. Details belong, more especially, to the engineer, but he should know exactly what he is required to accomplish; his art only furnishes the means to an end pointed out by sanitary science.

IT IS AN IMPERATIVE LAW,

which can not be violated with impunity, that organic wastes of every kind must be removed from inhabited places before the process of putrefaction begins. The excrements of man and domestic animals, the refuse of manufacturing processes, garbage, offal, wash-water, kitchen-slops, decaying vegetable or animal matter, whether liquid or solid, must be carried to some place where the same can not contaminate the air breathed by man, pollute the water which he drinks, nor infect the food which he eats. As the excreta from the kidneys and intestines of a thousand human beings in a community amount to more than a ton each day, it follows that the annual product of this kind in a city of one hundred thousand inhabitants is about forty thousand tons. The higher the organization of the animal the more poisonous are the excreta in a state of putrefaction. Domestic animals contribute a varying quantity, as a greater or less number of them are required for luxury or industrial use, according to the pursuits and habits of the people in different localities. The waste of kitchens is only second in importance to the excreta of human beings and the domestic animals. Distilleries, breweries, tanneries, slaughter-houses, gas works, various factories, produce more or less liquid or solid organic matter in different cities. The putrescible matter of street-sweepings really belongs in the category of animal excreta.

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[1] The area of Detroit is 18.1 acres.

Now, it is very evident that all

SOLID ORGANIC REFUSE,

such as garbage, offal, and manure, must be removed by cartage. No system of water carriage can be devised which will answer the purpose. Portions of garbage, offal, etc., if properly managed, may be economically fed to ducks, geese, chickens, fishes, or swine. The rest must be returned to the land for fertilization, except in places, like New Orleans, where there is no land and a great river may safely receive all that is given to it. Where there is neither land nor mighty stream, a perpetual fire must swiftly do the sanitary work of oxidation. Here, again, details must be left to the engineer, supplemented by the practical economist; only the engineer and the economist must not at all interfere with sanitary ends. The most difficult problem of all is to get safely rid of liquid organic refuse, that is, of water containing putrescible matter in solution or suspension. Engineers who are quacks in sanitation, and sanitarians who are quacks in engineering, have practiced running it into the drainage systems of inhabited places. In fact, this has been the plan generally adopted, till quite recently Col. Waring, who is both engineer and sanitarian, has been bold enough and enlightened enough to put into practice a plan that was previously little more than a timidly-advocated theory. To the great detriment and cost of the public, the sewerage systems adopted in towns are determined by men who are profoundly ignorant of both sanitation and engineering.

THE PREVALENT PRACTICE OF REMOVING SEWAGE BY MEANS OF THE WATER DRAINAGE SYSTEM OF INHABITED PLACES IS OPEN TO MANY AND VERY SERIOUS OBJECTIONS.

1. Ditches, gutters, tiles, and porous brick conduits for removing surface and sub-soil water are comparatively cheap. It adds immensely to the cost to transform water drains into sewers, so as to make them at all fit to convey liquid wastes. The combined expense of a separate drainage system and an independent sewer system is much less than the expense of a single system that cannot be so constructed as to perform well the double service of removing water from the soil and liquid refuse from habitations.

2. In most places it is not difficult to find a proper outfall for the water of a drainage system. As soon as sewage is mixed with the flow of drains the whole mass is contaminated, and the trouble and cost of securing a safe outfall are, as a rule, greatly increased. The necessity of pumping vast quantities of rain-water and sub-soil water, mingled with the liquid refuse of houses and factories in the same system in the new sewerage-works of Berlin and Dantzig, increases the running expenses to an extent threatening failure.

3. The sewage proper of a city is nearly a constant quantity. It is approximately measured by the amount of water daily used in houses and factories. Consequently, the engineer in constructing a system for the removal of sewage proper can adapt it to a constant flow and make it self-cleansing. On the contrary, rainfall is an immensely variable quantity. A drainage system for its removal must be of maximum size. When sewage, therefore, is turned into the drainage system, a slow flow will be inevitable much of the time, resulting in putrefaction and the generation of sewer-gas, the presence of which within the area of inhabited places dangerously violates the most vital law of sanitation.

4. In the drainage system all conduits are purposely made to let water in. The object is to convey water away from the

soil. But a porous drain will strain sewage through into the earth, and gradually pollute it. Consequently, a conduit for the conveyance of sewage must be made tight. Hence the absolute incompatability of the two ends sought in the same structure. A good sewer is a bad drain. A good drain is a dangerous sewer. Attempts are constantly renewed to attain the double quality of perviousness from without and imperviousness from within, with unceasing and inevitable failure. Sanitarians who are quacks in engineering have tried it in vain. Engineers who are quacks in sanitation have tried it equally in vain. Quacks in both engineering and sanitation, sometimes well represented in City Boards of Public Works, obstinately keep up their search for the unattainable, like the seekers of the philosopher's stone and the inventors of perpetual motion.

5. Water stored in cisterns is almost invariably poisoned by the way of overflow pipes which discharge into the sewer system of inhabited places and return the dangerous gas. And the drain-pipes from cellars and basements generally furnish avenues through which this invisible foe of human life in cities finds easy ingress to habitations. A separate drainage system affords an easy means of guarding against peril from such a source. Sanitary inspectors are often astounded by finding a tube from an ice-box, in which choice and delicate food, like meats and milk, is kept, running directly into a sewer-pipe. The combined sanitary and engineering quack will tell you, with pitiful ignorance, that the deadly sewer gas is kept out by means of a little water-trap through which a baby could blow with a straw. A separate system, used exclusively for sewage, is the only certain safety against such danger.

6. With the clumsy, costly, perilous, combined system in general use for removing water and sewage together, the earth of towns gradually becomes infected with organic matter in a state of putrescence. Hence the water of springs and wells at length becomes polluted and unfit for use. With a separate, properly constructed and properly managed system of impervious pipes for the removal of all sewage, and with other sound

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an not be taken to make the sewer system of a
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It may be, exceptionally, into a great river, as
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e land for disinfection and fertilization. Whether
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of these methods, will be best in a given instance, must
rmined by sound engineering and sanitary judgment.

The great principle to be kept in view is the removal of sewage (not sewage diluted with vast quantities of surface and subsoil water) without pollution of the soil, without putrefaction, and consequently without generation of sewer-gas on the journey.

The entire excreta of human beings may be admitted to the sewerage system for water-carriage. The privy vault should not be tolerated in any civilized neighborhood. Where there is no sewer system, some form of earth closet ought to be used, and the contents frequently removed. The liquid portion of the excreta of horses and other domestic animals should be constantly removed by the sewer system. The solid portion should not be thrown upon the ground and bleached by rain, but be kept under cover, dry, and frequently carted away. In fact, no organic matter should be thrown on the ground, nor deposited in the ground near human habitations. The soil where man dwells is sacred, and it is sanitary sacrilege to pollute it. He who fouls the air that he breathes himself, or the water that he drinks, or the food that he eats, is a barbarian who might learn wisdom from the cat or decency from any swine not demoralized by contact with man. He who fouls the air that another must breathe, or the food that another must eat, or the water that another must drink, is a criminal, to be classed with those who maim and kill.

There are more reasons for such care in the removal of organic wastes from inhabited places than appear on the surface. The chemistry and hygiene of putrefaction are complex, involving many practical considerations. Wherever there is a collection of putrefying organic matter, whether on the ground, in the ground, within a faulty sewer, or under a habitation, there is a tireless foe to health and life. Not only are putrescent collections of garbage, decaying vegetables, manure, offal, and human excreta harmful in themselves, by reason of exhalations poisoning the air and leeching liquids polluting the earth; they are also depositories and multipliers of disease germs. Such collections may not produce infectious diseases *de novo*, but they lessen the vitality of people living in the neighborhood, and thereby lessen the power of resisting epidemics. It is a well-known pathological fact that nature struggles to eliminate disease by excretory processes. Accumulations of filth containing excreta may therefore harbor seeds of various communicable maladies. Sewer-gas, while it may not beget scarlatina, diphtheria, small-pox, and other contagious diseases, easily becomes the vehicle of conveying them, through obscure and intricate channels. Nor is this all. It is well known that a dung heap will take cholera, hold it for an indefinite period, and convey it to human beings; that is, cholera dejecta thrown upon a dung-heap will plant in it the germs of the disease, there to take root and multiply, and may communicate themselves to man under favoring circumstances. A privy vault will take typhoid fever, have it badly for a long time, and communicate the disease to human beings. It is probable that a heap of putrescent garbage may catch diphtheria in the same way, multiply its germs, and communicate them to unsuspecting children. There is little doubt that every seething mass of organic matter is affected with yellow fever in the midst of an epidemic of that disease. It is believed by many experienced physicians that yellow fever is not communicated from person to person, but is always caught from surrounding objects.

So great is the influence of filth in these various ways that no epidemic can make any serious headway in the midst of cleanliness. One frequented privy vault, down with typhoid fever, is more dangerous than a house full of human patients. A big trunk full of dirty clothes, sick with yellow fever, is more to be shunned than a small hospital full of human victims of the disease. A village dung-hill, planted with cholera, is more perilous than a dozen cholera corpses. A foul sewer, swarming with scarlatina germs, may be more dangerous to a neighborhood than an infected school house.

IT HAS BEEN OBJECTED IN RELATION TO SEPARATE SYSTEMS for drainage and the removal of sewage, that droppings of horses and other animals in the streets, steeping in the rainfall, will be a source of pollution to surface water, rendering it putrescible, and consequently capable of generating sewer-gas. The simple and effective remedy is cleaning the streets frequently and well. Most cities would thereby be greatly improved, both in appearance and salubrity.

It has also been objected, that, in quarters where the vitrified pipe sewer system for the removal of sewage does not extend, there the inhabitants must throw the liquid wastes of household life upon the ground. No such necessity exists. Even an isolated habitation in the country should have its sewer-pipes, and entirely separate from the drainage system, to convey kitchen slops, wash water, and other dangerous liquids to a place of safety. The reason why typhoid fever, diphtheria, and some other filth diseases are so prevalent in country districts is that privy-vaults so frequently seep into wells, and animal excreta of pig-pens and stables are left to poison the earth and the air. The ground about kitchens, super-saturated with slops, very often becomes putrescent in the summer warmth, breeding disease which superstitious ignorance attributes to Heaven. A householder may dispense with his parlor and its adornments, if necessary, but he can not afford to invite upon himself and family disease and death by neglecting to provide the means of keeping the site of his habitation dry and clean. *Laborare est orare*,—"to labor is to pray,"—said the wise old monk, and the most effective prayer for health is to supply every needed hygienic device for the sacred home of the family.

It is further objected that most of our cities are already sewered for the double purpose of removing storm water and sewage through the same conduits, and that we cannot afford to do the costly work over again. It is one of the fates of progress that faulty methods must be followed by reconstruction. No works last forever; and when we build anew we can do it better.

In the mean time, the faulty old sewers, with their dangerous debouchement into the nearest streams, lakes, or ocean harbors, can be washed out, disinfected, and used exclusively for water-drainage, while a supplementary system, with safe outfall, for the removal of sewage alone, is constructed with proper engineering skill under the direction of sanitary science. The cost of such a supplementary system is not more than one-fourth of that of the prevailing system.

MANY OBSTACLES

lie in the way, which must be overcome by effort and conflict. In the first place, civil engineers must be taught enough sanitary science to make them understand the limitations of their own sanitary ignorance. Otherwise, they will continue to use their large influence with town authorities to persist in making costly, fine sewers that are not and can not be adapted to the incompatible double purpose of removing storm water and sewage; just as architects persevere in constructing monumental hospitals in defiance of medical, surgical, and hygienic requirements.

In the next place, the inertia of popular ignorance and apathy, and the conservative resistance to innovation, must be met and conquered. At the outset, the sanitary teacher and preacher is the sole reliance. His services can never be dispensed with. Especial treatises, the proceedings of sanitary associations, and, above all, the constant reiteration of hygienic facts in the periodic press, are rapidly creating a public opinion which will be irresistible. The family doctor is already looking for the causes of diseases in the sanitary surroundings of habitations. The servant of Christ, like the good Bishop Ireland, of Minnesota, begins to instruct his flock to observe cleanliness, as well as to pray, in order to avert the wrath of God in epidemics.

Finally, a public sanitary conscience must be created by the enactment and enforcement of wise sanitary laws. "I have given it as my deliberate opinion," says Alexander Baine, "that authority or punishment is the commencement of that state of mind recognized under the various names of conscience, the moral sense, the sentiment of obligation. The major part of every community adopt certain rules of conduct necessary for the common preservation of, or ministering to, the common well-being. They find it not merely their interest, but the very condition of their existence, to observe a certain number of maxims of self-restraint and of respect to one another's feelings on such points as person, property, and good name. Obedience must be spontaneous on the part of the larger number, or on those whose influence preponderates in the society; as regards the rest, compulsion must be brought to bear."

It is not proposed that "those whose influence preponderates" shall constrain the rest to adopt a particular sewerage system, but that they shall compel, by wise and regular administration, the general observance of sanitary laws for the common good. "Compulsion must be brought to bear" to secure respect for health and life, as well as for property and good name. The recent experience of England and of certain cities in the United States clearly demonstrates that enlightened public opinion fully sustains the judicial enforcement of sanitary codes.

Of course, the system here described is far in advance of any now practically adopted and executed, but it affords a high standard for comparison, and an ideal towards which sanitary engineering is ardently striving. The combined system of Detroit is the result of accretions, as the city has grown without a definite plan. Judged by a system entirely satisfactory from a hygienic point of view, it is defective enough; but, judged by other systems in use in American cities, it is among the best. The natural advantages of outfall and ground cannot be surpassed. The older portions of the system, while strikingly defective in the light of recent knowledge, are monuments of the enterprise, intelligence and public spirit of honored citizens. To point out the defects of our sewer system cannot be construed as in any way reflecting upon those who, in advance of their time, projected and executed it. To blame them would be quite as ungenerous and unjust as to blame Sheele and Davy for not knowing as much chemistry as Roscoe and Frankland.

In this connection, I gladly avail myself of a critical description of the sewerage system of Detroit, made by Mr. W. F. Craig, C. E., Assistant City Engineer, in an honest and courageous paper read before a State Sanitary Convention at Detroit, in January, 1880. The facts given by Mr. Craig have not been successfully disputed, and it would be much better to make them the basis of improvement than to pervert them into occasion of personal abuse. The gist of his criticisms will be found in the following extracts :

PUBLIC SEWERS.

" The construction of some of the older sewers has been very deficient, they being laid with dry bottoms with the top arch grouted or laid in common lime, which has since dissolved or worn away, and are now much out of shape, as may be seen in Randolph and Riopelle streets, and I persume in most of the sewers built at that time,—as well as rising the hill at Jefferson avenue and Fort street at a very steep grade, making them from that point too high to effectually drain many of the deeper cellars connected with them,—as well as having numerous depressions which allow sediment to accumulate, and which is the case with nearly every sewer in the city. Among the most foul may be mentioned Labrosse, Seventh, Fourth, Lewis, Second, Second below Michigan, Grand Sewer, and Randolph street sewers, the deposit reaching 1½ feet in depth and in some instances more, with numerous shorter places of the same kind in other sewers and all the outlets.

" Among the peculiarities of the sewers of this city is the manner of their connections. At Seventh and Michigan a sewer 3 feet 9 inches by 5 feet, discharges into a sewer 3 feet in diameter on the same grade. At Fourth street, south of Michigan avenue, a 4-foot cylinder discharges into a 3-foot cylinder as before. At the Eleventh street outlet there is received the Seventh street, Trumbull avenue, and Twelfth street sewers, and in my judgment it is not too large for Trumbull avenue sewer alone.

" The Grand sewer receives Cass street sewer and Shelby street sewer, and is of smaller section than the former (Cass street sewer), besides having an outlet impeded by water-pipes 8 inches in diameter passing directly through it, and which is the case with the same sewer east of Woodward avenue, 6 pipes passing through it at different places. Nearly every sewer connects with another at right angles and often on steep grades, making their effect at clogging the receiving sewer the more severe. At the corner of Third street and Canfield avenue the Third street sewer curves up stream to make as near a right angle connection as possible. At the corners of Beaubien and Fremont and McDougall avenue and Fremont streets are curves that would do credit to a snake, and need to be seen to be appreciated. The Woodward avenue sewer below Woodbridge street seems to have no bottom except the original clay, being constructed with side walls arched, and has washed out in places. The bottom was washed out of the old Grand sewer in a dozen places, also the sewer at the corner of Fifth street and Michigan avenue, as well as innumerable small holes in the top of the older sewers.

" Sewers were built as far back as 1836, and are still in operation, although too large, as mentioned in Mr. Smith's report of 1861; but now, as improvements have been extending in their districts and more territory drained into them than intended when built, they have been found inadequate to carry the water or too shallow to drain the cellars, which has called out attempts to relieve them by connecting any other sewer in their vicinity that might relieve them for the time being, which already has made such a labyrinth of sewers that it would puzzle any one to tell where certain rainfall enters the river; and of such sewers, I should doubt the utility of running a sewer through Locust street from Crawford street to Trumbull avenue to relieve Crawford street sewer, when Trumbull avenue has an insufficient outlet for itself, besides depriving Fourth street sewer of its water and making it the most foul sewer in the city, and without providing some means of flushing it. This same is the case with

Labrosse street sewer from Fifth street to Trumbull avenue, only the connection of Labrosse street sewer is so low at its outlet, and being stopped with quick-sand, that it contains about 1½ feet of matter that most persons would prefer to see at a distance. Although these sewers may do some good it is principally to the extent of their capacity in holding water, and under pressure undoubtedly deliver some of it to its outlet.

"I should also doubt the healthfulness of draining the old Grand River avenue sewer into the Cass street sewer and leaving it open to be flooded or back-watered, allowing the matter to settle, when on the receding of the water it becomes a first-class gas-machine. I should also doubt the utility of spending big money for a cut-off for Randolph, Brush, Beaubien, and St. Antoine street sewers, in Woodbridge street, when the same several sewers at Fort street east are only about 8½ feet deep to their bottom, when by extending the cut-off up to about Gratiot avenue, where the ground is higher, and consequently the sewers have more depth, and by so doing utilize the sewers above that point, and devise sewers suitable to the requirements of the points below.

"Every outlet in the city is inefficient for the capacity of the sewer leading to it, they being built nearly or entirely submerged, which allows the water to back in them from 200 feet to 3,000 feet, thus allowing the sediment to settle in them (from the slack current in the ordinary flow), and give off the dangerous gases as well as chokes the outlet, when required by storm-water, and as a consequence most of the sewers have been under a pressure of water or back-water from 6 to 30 feet, backing into drains, cellars, etc., and doing much damage as well as driving all sewer-gas into the most convenient opening, traps to the contrary notwithstanding. And taken with their right-angle connections, I should judge that they will not carry within from 30 to 50 per cent. of what they should carry and were evidently calculated to carry, which is a very important item when they will not now carry freely and without flooding as much as is demanded of them.

"Lately side man-holes have been constructed in all the deeper sewers for the purpose of making a cheaper connection for receiving basins and laterals, giving the water a dead fall of from 3 to 25 feet, vaporizing the sewage, which may be carried up the sewers, without providing means for ventilation, or to give direction to the water falling, that it may not impede the water-flow in the main sewer, as well as preventing an inspection without a bath when there is water flowing in them. In several instances main sewers are connected the same way, as may be seen at the corners of Woodbridge with Beaubien and St. Antoine streets, at the corners of Fremont street with Russell street and Grandy avenue; and at the corner of Randolph and Woodbridge streets a 5-foot sewer discharges into an 8-foot sewer direct in the top with at least seven feet fall in the clear, notwithstanding the 8-foot sewer was intended to drain four other sewers back of this connection, and I think it a disgrace to any one having to do with it.

"To my knowledge, there has been no attempt to ventilate or flush our sewers, nor is there a flap-valve to prevent sewage-gas from flowing free, which allows it to concentrate. Formerly ventilation was partially accomplished by means of the receiving-basins being untrapped, but so many complaints were made that finally those in the greater portion of the business part of the city have been trapped, as well as along most of the paved streets where stone receiving-basins have been placed. All grates in the unpaved streets are placed over the open ends of pipe and are not trapped, and generally being in back streets are not so much heard of as a nuisance, although frequently the gas is well concentrated, and I have noticed it very strong on the sidewalk in certain stages of the atmosphere. Although I am well aware that at the ordinary temperature of the sewers (about 65 degrees), certain stages of the atmosphere will cause a down draft, it has been, and is, I think, generally up in both public and lateral sewers, and I am perfectly satisfied in my own mind, after a careful examination of the sewers, that with the good general grade and the volume of their ordinary flow, if

One of the gravest defects of the sewer system of Detroit is that the mouths of the main sewers empty into the river in part below the water line. Just so far as the outlet of the sewer lies under water, to that extent is it obstructed, causing a daming back inside of the sewer to force a full outflow. Such daming back also causes a pressure on the air or gases in the sewer above, forcing traps in drains leading from houses. Besides, the partially submerged mouths of sewers become more or less filled up with sediment, mechanically obstructing them and lessening their capacity to carry off storm-water. And around the mouths of the sewers, in the dead water near the shore, there is going on a constant filling-up process, by deposit of sediment. The following report of the Harbor Master to me will clearly indicate the serious mischief caused in this way:

METROPOLITAN POLICE DEPARTMENT,
DETROIT, Mich., Feb. 28, 1882.

O. W. WIGHT, M. D.,
Health Officer, City of Detroit:

SIR—You request to be furnished the soundings at the outlets of the public sewers, and other information relating thereto in my power to give. I respectfully submit the following:

Name of Sewer.	1878. Feet.	1879. Feet.	1880. Feet.
Adair street	3	3	3
Campau avenue	8	6	6
*Chene street	7	7	7
‡St. Aubin avenue	6	6	6
‡Riopelle street	15	12	10½
Randolph street	11	6	6
§Woodward avenue	11	8½	4½
§Griswold street	4	4	4
¶First street		10	5
Fourteenth avenue		5	4½
Seventeenth-and-a-half street	5	5	5
Twenty-first street	7	7	6½
Twenty-fourth street		3½	3½

REMARKS.

*About 30 feet from the outlet.

‡Cannot get a true sounding; I cannot get my boat under the dock; have to take it angling with a pole from the slip.

§The first two are at the edge of dock, the last about 30 feet from the outlet or mouth.

¶The last, 10 feet inside the edge of dock.

None of the outlets extend far enough out for the current to take the flow from the sewers. Adair street sewer empties into the slip several hundred feet from the current; Chene street sewer is also quite a distance from the current; Riopelle street sewer empties into the slip about 90 or 100 feet from the current; Fourteenth avenue sewer is about 100 feet from the current; Eleventh street sewer, which runs through the M. C. R. R. yard, I cannot get near the outlet, as the spiles are driven so close together it is impossible to get a boat anyway near it, therefore cannot report it; Twenty-fourth street sewer empties into a bay and shoal water, several hundred feet from the current. It has been the usual practice, in building the outlets, to construct coffer-dams, on the outside, and when the sewer is finished, the sheet-piling is drawn from the coffer-dam, but the filling (generally composed of tenacious clay) is left, and of course obstructs the flow from the sewer, and hence the filling up.

I have noticed on several occasions, after a heavy rainstorm, with the wind from the southwest, the flow from the Randolph street sewer will go up the river, filling the small slip used for the Harbor Master's boat-house, one hundred feet above the sewer, with filth, dead rats and other garbage, creating a horrid smell. This is caused by the outlet not being far enough out, as the D., M. & G. H. R. R. docks above are built so far out that it creates an eddy at this place.

There is a small sewer which empties into the slip foot of Mt. Elliott avenue; it is shoal and stagnant water, as the dock (solid ground) on the upper side of the slip extends out several hundred feet.

I took no soundings last year (1881), but will the coming summer.

Respectfully submitted,

JOHN W. MOORE,
Harbor Master.

From all of which it is apparent that dredging should be done without delay in the river bottom around the mouths of the sewers, and the lower, partially submerged ends of the sewers, more or less filled with silt, should be cleaned out. The defects of the sewers, already pointed out, suggest to the engineering department of the city government the proper remedies.

In my judgment, lateral sewers should be of sound cement or vitrified pipes, adapted in size to the area to be drained, well laid and tightly jointed. They should connect with the main sewers at an acute angle, so as not to obstruct the flow by transverse currents. Proper Y connections should be provided opposite all premises to be drained. And I earnestly recommend that a separate system, to be used only for sewage, be kept steadily in view as a future possibility. Existing sewers will remain useful and necessary for storm-water drainage. It may require one, two, or even three decades of time, but Detroit will at length adopt and execute a better system.

A far greater sanitary danger to the city than the imperfections of the sewerage system is the introduction of sewer-gas into habitations by faulty methods of house-drainage. Privy vaults are constructed in thousands of back yards and connected by untrapped crocks with the sewers. Flushing water is not provided. Once or twice a year a putrid mass of excrement is washed out into the sewer, liberating great volumes of poisonous gases, frequently loaded with the germs of scarlet fever, diphtheria, and other infectious diseases to be forced into habitations, perhaps blocks away, through waste-pipes insecurely trapped, or not trapped at all, to do their deadly mischief in unsuspecting households. In many a house, especially of the tenement class, there is a waste-pipe, often untrapped, from the kitchen sink to the privy vault, giving free ingress to the odors, poison-laden, that no pains should be spared to exclude.

This matter is of such grave importance, that I here reproduce in a condensed form a few paragraphs on the subject written elsewhere.

SEWER-GAS.

That peculiar organic vapor generated by the putrefactive fermentation of animal excreta is not very well understood by chemists. At Paris, the gas which bubbles up from the sewage-beds in the bottom of the river Seine has been found to contain in one hundred parts—

Carburetted hydrogen	72.88
Carbonic acid	12.30
Oxide of Carbon	2.54
Sulphuric acid	6.70
Other susbtances	5.58

But the chemical composition of sewer-gas does not fully indicate its deleterious nature. It is not only a poison in itself but is also known to be a vehicle for conveying the disease-germs of typhoid fever, small-pox, scarlatina, diphtheria, and other contagious and infectious maladies. It is less obvious to the senses than sulphuretted hydrogen, but in small quantities is more deleterious in its effects.

How to keep this poisonous gas out of buildings connected with public sewers is a problem that interests a large number of people in this city. "An old-fashioned sewer," says Geo. E. Waring, a very high authority in sanitary engineering, "has been well called a retort for the manufacture of sewer poisons which are 'laid on' at every house by an ingenious system of pipes delivering an intermittent supply through every water-closet, bath-tub, and wash-basin, and producing its annual crop of zymotic diseases." "It is very well," says Dr. Sandwith, "to boast of traps and of similiar mechanical arrangements, but remember there is such a thing as corrosion of metals, and the smallest defect, no larger than the interior of a straw, may introduce into your houses vast volumes of gas."

From all of which the prudent householder may conclude that his family is safer without the connection with the public sewers. His conclusion is unquestionably correct, unless he has the intelligence to find and the means to pay for the services of an architect, a builder, and a plumber, who know enough to construct a "modern" house without filling it and poisoning it with sewer-gas.

HOW TO KEEP IT OUT.

A water-trap is almost universally relied upon to prevent the ingress of poisonous vapors from the sewers through drain-pipes into houses. Such "traps" are only a delusion and a snare. The water in them is by no means an effective barrier against the dreaded gas. Every boy who blows through a straw into a tumbler of water knows that his breath bubbles up from the bottom of the glass. When, from any cause, the pressure of the air is less inside the house than it is in the sewer, it will pass in through the trap almost without obstruction. A sudden fall of rain, filling the sewers, causes pressure of the gases therein and forces them through water-traps into our habitations. The fall of temperature at night, especially during the colder part of the year, produces a greater contraction of air in the dwelling than in the underground sewer, which causes a slow but continuous ingress of the invisible enemy. Draught of the chimney, sucking in air to feed the cheerful fire in winter, when all the doors are closed, also sucks in the sewer-gas, through the inverted syphon filled with a slender column of water below the wash-bowl. Moreover, it is a well-known chemical fact that liquids absorb and transmit gases. Recent experiments at Glasgow and New York prove that sewer-gas passes abundantly through the water in a trap, even when there is no outside pressure or inside suction to help it along. Besides, every time water is thrown down through a waste-pipe, syphon action is liable to empty the trap entirely, leaving, perhaps for hours, a free aperture from the foul sewers into that portion of the house most used. If the wash-basin or water-closet is not used for a day or two, the water in the trap will evaporate and thus open the door to the subtle fiend. Bad workmanship may leave an open joint, decay may make a fissure, accident may cause a slight break, through which this ever-present ally of disease and death may steal its way to the innermost recesses of our homes and cause them to be draped with mourning.

The first requisite to guard against the ingress of sewer-gas is good material and faithful workmanship. Then a safe egress must be made for the "viewless" fiend. Send him elsewhere. Outwit him by giving him an escape into outer air. This can only be done by complete ventilation of the whole house drainage system. The soil-pipe, instead of having a closed termination within the house, must run up through the roof and the end be left open in the upper air. A "hood" may be placed above it, giving it a draught, like a chimney. The ascending gas can then not only find its way out, but it will be drawn out. It is well to speed the parting of the unwelcome and unwholesome guest. Wherever there is a smaller waste-pipe or soil-pipe in the house, leading from a water-closet, bath-tub, sink, or wash-bowl, a ventilating pipe should be carried from below the trap into the main soil-pipe running to an open termination above the roof already described. These smaller ventilating pipes not only draw off the sewer-gas in the smaller waste-pipes and soil-pipes, but also prevent syphon suction from emptying the traps. The house-drain should lead to the public sewer through a trap. And above this trap a ventilating pipe, outside of the house, should be carried up above the highest windows. There will then be a perfect circulation of air from the outside ventilating-pipe, through the soil-pipe, ascending above the roof.

Ventilating pipes have sometimes been carried into chimney flues. This is wrong, for often there is a down draught through the chimney at night, caused by the cooling and consequent contraction of the air within, which would bring the gas directly into the living-rooms of the house. The roof-leaders have sometimes been used as ventilating pipes outside. This is wrong again, for the roof-leaders may be filled by falling rain just when the compressed gas in the sewers, flushed from the same cause, is escaping most freely.

In nine out of ten, probably in ninety-nine out of a hundred houses in this city connected with the public sewers, the gas in question is a perpetual guest. Like the traditional ghost, it comes through closed doors. It comes to stay. Nothing but the subtle cunning of science can bar its ingress. It is worse than the skeleton that is said to be in every man's closet. It is more unwholesome than a rotten corpse. The cadaver might be enclosed in a single room. The poisonous gas is everywhere. The effluvium of the corpse does not lie in ambush. The gas comes from the organic decay of the whole neighborhood. To-day it brings with it the contagion of typhoid; to-morrow it introduces diphtheria; next day it smuggles in scarlatina. It gives no warning, and its unknown presence is not shunned. It sleeps with you, creeps into every cell of your lungs, and lays shadowy fingers on every drop of your heart's blood. "Animal matter," says Dr. Robert Angus Smith, "which chiefly is found to be dangerous, is, in fact, the fæces or dejecta of human beings and of cattle. It might be supposed that these substances had already been decomposed, but such is not the case. The decomposition is very imperfect, and, when they are allowed to stand, putrefaction sets in, closely allied to, perhaps exactly the same, as that which takes place in other animal matters, such as blood, or in a mixture of flesh and water. When these substances decompose, the result is, so far as we know, nearly the same as the decomposition of the entire animal body. We are not able to tell the difference between the products of putrefaction from our cess-pools and those from our grave-yards." Excreta are the wastes of the body, and in decay more dangerous than the body itself. Sewer-gas, the product of the putrefactive fermentation of excreta, is more poisonous than the effluvium of a decomposing dead body.

SHOULD VENTILATION OF SOIL-PIPES BE COMPULSORY?

The spirit of our institutions is in favor of personal liberty. The public authority, or the governing agency, should not interfere with private rights. It is a belief entertained by many, that a man has a right to do what he pleases on his own premises. This doctrine, in order to be tenable, must always be qualified by the further proposition that a man has a right to do on his own premises, or elsewhere, what he pleases, provided he pleases to do nothing injurious to others. He cannot do what violates the rights of others, simply because he does it on his own premises. For example, no man has a right to store gunpowder in his kitchen. He has no right to undress before an open window of his house looking out towards his neighbors. He has no right to allow accumulations of human or animal ordure on his premises, to the sanitary detriment of the public. He has no right to kill his own child because he does it in his own house. Neither has he a right to endanger his own household and perhaps set up a center of contagious or infectious disease, by neglecting or willfully refusing to employ the proper means to keep poisonous sewer-gas out of his house. The public agency has a right to forbid him the use of public sewers, unless he will conform to regulations manifestly for his own as well as the public good. The caprice of the individual must be subjected to the well-being of the whole. He who intelligently demands personal liberty for himself must respect it in all. Freedom and obedience to just law, properly tempering each other, constitute enlightened liberty.

Civic authorities, in all civilized countries, have imposed regulations for the general good. Cities, therefore, fix fire limits for the public safety. They regulate the sale of intoxicating drinks by requiring licenses. Here and elsewhere, conditions are imposed on the use of public water. There is no reason why regulations for the use of public sewers should not embrace a requisition to ventilate soil-pipes in the houses of individuals. Such a requisition is rigidly enforced in various cities of Germany and England. There is no reason why it should not be enforced here. No man has a right to poison his wife and children with sewer-gas, any more than he has to feed them with diseased or putrid meat.

Therefore, I recommend the Common Council of this city to pass a carefully drawn ordinance, requiring every citizen who is permitted to connect his house with the public sewers to comply with regulations that shall secure his household against unsanitary conditions. Most admirable are the conditions required by the authorities of Frankfort-on-the-Main, under which, buildings, yards, gardens, etc., are allowed to be drained into the new sewerage system. Complete plans must be furnished by the owners of property, a duplicate copy of which is kept among the documents of the sewer department. The plans presented must contain all the works projected. Excellent from a sanitary point of view is the requirement that "all drains are to be so arranged as to accomplish the most complete drainage practicable of the buildings and grounds." The method of drainage and the materials to be used must be approved by the sewer department. Tarred iron pipes, lead-jointed, are recommended as the most durable and safest, and, in and near the houses, must be everywhere used as described. Earthenware pipes are permitted, but within the house they must be encircled with a layer of concrete at least ten centimeters thick. All drains must be jointed water-tight. Drains must be shut off by flap-valves, which can be screwed down securely, whenever there is danger of a back flow when the sewers are unusually full. Rain-water spouts must be carried underground into the sewers, and must be of iron with cemented joints. All pipes must have a fall of one in twenty, except by special permission and with provision for abundant flushing. Cisterns for rain-water must be made with overflows dipping below the surface of the water and secured by syphon-traps. Fluid substances from houses, yards, passage-ways, etc., are not allowed to run into the public streets, but must be carried underground into the sewers. Immediately after completion of a house-drainage system, all vaults must be emptied and filled with earth. The connection of any water-closet can be permitted only when the water supply is sufficient to completely flush all matters through the local drains into the sewers. Exactly to the point under discussion is the regulation that "the vertical soil-pipes of all water-closets, even if small in diameter, must be carried up above the roof and beyond all windows, for the sake of ventilation." These and many other admirable regulations, to the number of twenty-five, are required of every person to whom permission is given to use the public sewers. The authorities imported an English engineer, Mr. W. Lindley, who, in co-operation with Dr. G. Varrentrapp, worked out for Frankfort-on-the-Main one of the finest sewerage systems to be found in any city of the world. A suitable inspector, conversant with the builders' profession and the plumbers' art, connected with the Department of Health, should co-operate with the Board of Works in carrying out a reform of this kind, which would sensibly decrease the sick list and death rate of our fair city. The cost to the public treasury would be but a few hundred dollars per annum. Owners of property would be more than compensated for the additional cost of "doing well what it is worth while to do at all," by the increased security of their households, by the greater comfort of living in an atmosphere free from sewer poison, by diminished doctors' and undertakers' bills, by the enhanced value of their homesteads. If new houses were built under such guaranties of sanitary safety, they would be sought for by tenants in preference to all others, at a higher rent. From which considerations I respectfully submit to the municipal legislature of the city

AN ORDINANCE

concerning the plumbing, sewering, and draining of buildings in the City of Detroit:

It is hereby ordained by the people of the City of Detroit:

SECTION 1. Owners, agents or occupants of buildings in the City of Detroit, desiring to introduce therein works of plumbing, sewering and draining, shall, from and after the passage and publication of this ordinance, observe the following regulations, to-wit:

1. All plumbing work shall be of good materials;
2. Only good workmen shall be employed for such work;
3. All soil pipes shall be of iron;
4. All soil pipes shall be accessible throughout their entire length for inspection;
5. All soil pipes shall extend through the roof and shall be of undiminished calibre;

6. All sewer pipes inside of any building shall be of iron:

7. Within any building sewer pipes shall be above the cellar floor and shall not be buried;

8. All joints in sewer and soil pipes shall be gas and water tight, and shall be caulked with either lead or with iron filings and sal ammoniac cement;

9. Traps shall be provided for all basins, sinks, bath-tubs and water-closets;

10. All traps shall be ventilated from the distal side by special pipes through the roof;

11. There shall be no traps on vertical soil pipes;

12. All "safes" under basins and refrigerators shall be drained by special pipes not directly connected with the sewer;

13. All service pipes shall be so placed as not to be in danger of freezing;

14. No pan water-closet, but either hopper or improved water-closets shall be used;

15. Every sewer pipe shall be provided with a trap between the building and the public sewer, and such trap shall be accessible for cleaning;

16. Between every such trap and the outside of the building, the sewer pipe shall be ventilated by a special pipe of not less than two inches calibre;

17. The ventilation pipe, aforesaid, shall be carried to a point where escape of gas from it shall not be injurious or annoying to occupants of the building or of neighboring premises;

18. All soil pipes and sewer pipes shall have a descent of at least one foot in thirty, except by permission of the sanitary authority, in special cases, when extra means of flushing shall be employed;

19. All overflow pipes from cisterns into sewer pipes or soil pipes shall be provided with traps;

20. No privy vault, or dry well, or cesspool, shall be connected with the drainage system of any building;

21. All pipes leading from sinks and slop hoppers to soil pipes and sewer pipes shall be guarded by strong metallic

strainers, the meshes of which shall not exceed one-sixteenth of an inch in diameter.

SEC. 2. Architects, plumbers, contractors, and all other persons engaged in the construction or repair of buildings shall conform to the enumerated regulations of the preceding section, and shall undertake no work in violation thereof.

SEC. 3. Permission shall not be granted to the owner, agent or occupant of any building to connect the same with the public sewer or to receive water from the public water works, until such owner, agent or occupant shall present to the proper authority for granting such permission a certificate from the Board of Health that the regulations enumerated in section one of this ordinance have been complied with.

SEC. 4. It shall be the duty of the Health Officer, or of a properly qualified agent, appointed by the Board of Health, to examine all buildings hereafter constructed in the City of Detroit, for the purpose of ascertaining whether the plumbing, sewering and draining of the same are in conformity with the aforesaid regulations, and to enforce such regulations in case of negligence or refusal to comply therewith; and it shall be the further duty of said Health Officer, or Agent appointed as aforesaid, on complaint of any responsible citizen that any existing building is unhealthy by reason of sewer-gas therein, to make a careful examination of such building for the purpose of ascertaining the truth of the complaint, and if he find that the complaint is true, to order the plumbing, sewering and draining of such building to be reconstructed so as to be in conformity with the regulations provided in section one of this ordinance; and in case of disobedience to such order, the Health Officer, or agent, shall inform the proper authorities, who shall forthwith disconnect such building from the public sewer and from the public water works, until said Health Officer, or agent, shall give a certificate that the regulations aforesaid have been complied with.

SEC. 5. Plans of all plumbing, sewering and draining works made in pursuance of this ordinance shall be furnished by owners, agents or occupants of buildings, to which such works pertain, and shall be kept on file in the office of the City Engineer, who shall make duplicates thereof for the use of the Board of Health.

SEC. 6. Any person violating any provision of this ordinance shall be subject to summary arrest, and shall pay a fine of not less than one hundred dollars, nor more than five hundred dollars and costs, and in the imposition of such fine and costs, the Court may make a further sentence, that the offender be imprisoned in the County Jail, or Detroit House of Correction, until such fine and costs be paid: Provided, however, that the term of such imprisonment shall not exceed the period of six months.

SEC. 7. All ordinances or parts of ordinances contravening the provisions of this ordinance are hereby repealed.

SEC. 8. This ordinance shall take effect from and after its passage and publication.

The present generation of Detroit owe a large debt of gratitude to the men who projected and have executed the present sewer system of the city. It is owing especially to the draining of the city's site that the death-rate has decreased one-third since 1845. Citizens who, in advance of the public sentiment of their time, fought for and secured the present system, with all its advantages, will be among the foremost to strive for something still better. They will be the last to say that perfection has already been achieved and that no improvements can be made. It is superfluous to counsel a prudent, conservative people to make haste slowly. Time will be taken, and should be taken, to consider the matter well. A better system of sewerage, in which the present system will be preserved and utilized, more scientific and safer methods of draining inhabited places, together with other important sanitary measures, will again reduce the death-rate by one-fourth. This will amount to 600 a year in the present population. As every unnecessary death represents, according to Playfair and others, a loss of

$1,000, the saving to the aggregate capital and labor of the city will be over half a million of dollars a year. The prosperity and growth of the city will be more secure. A deserved reputation for salubrity attracts population. People will gladly migrate to a city where greater length of life and greater freedom from disease are added to the attractions of good society and beauty of location. Nothing pays so well as sanitation. Such a system of sewerage and house drainage as I have described in the beginning of this chapter would pay for themselves in one year. Let us not be contented with anything for our fair city that falls short of the highest known approach to perfection!

SLAUGHTER-HOUSES IN THE CITY OF DETROIT.

"*When the extent to which the State shall interfere with the action of individuals, for sanitary protection is in question, we must of course keep in view the traditions and prejudices of our people, which are all in the direction of restraining the government within the narrowest bounds which are consistent with public welfare and safety. But the question, what the limit shall be, is one of policy rather than of law. The judicial decisions recognize the most ample power in the State to do what seems best in sanitary matters. In Louisiana, the State went so far for the protection of New Orleans against the customary evils of slaughter-houses, as to give to a company of individuals the monopoly of the slaughter of cattle for the market; an exercise of power that at first seems startling, but it has been fully sustained by State and federal authorities.*"—JUSTICE COOLEY.

SLAUGHTER-HOUSES IN THE CITY OF DETROIT.

Soon after I took charge of the Health Department of this city, I directed Mr. A. S. Lane, the Inspector of Meats and Provisions, to report to me the number and location of all slaughter-houses in Detroit. It was a work of considerable magnitude, and required time. I went with him to visit and inspect several of the worst and some of the best. In the meantime, complaints were made by citizens, whose homes were rendered uncomfortable by the noise and odors of neighboring slaughtering places. Some complaints charged especially and exceptionally filthy and unwholesome conditions. When official inspection verified the charge, orders were issued to the offenders and the nuisances were abated. Others complained that slaughtering should be allowed in the city at all. It was only necessary to remind them that the health authority could not prevent what the law allows.

Mr. Lane at length completed his task and made three reports to the Health Officer. The first report contains an account of the slaughter-houses that are in the best condition. The second contains an account of those that have some defects. The third describes some that are bad. I am happy to say that the first list is most numerous, and that the last contains but few names. It may well be a matter of pride to Detroit that the slaughter-houses hitherto endured are better and cleaner than those found in most large cities. Ample sewers, with a good outfall in a great river, have enabled the proprietors of slaughtering places to keep their premises decently clean.

As few citizens know much about the slaughter-houses of Detroit, except those in their own vicinity, and causing them especial annoyance, I give here the reports of Mr. Lane in full.

FIRST REPORT.

DETROIT, Feb. 9th, 1882.

To O. W. WIGHT, M. D.,
Health Officer.

DEAR SIR:—I hand you the following report, showing the number of slaughter-houses in the City, their location, condition and the number of animals slaughtered in each, as near as possible:

Andrews, Samuel, 69 Duffield street, slaughters 25 cattle per week and 125 sheep. He has proper sewer connections; box below the floor, holding about 100 gallons, with plug in bottom to pull out when the box gets full of blood, manure and water, which they keep running while they are slaughtering. The floor is good; also the yards are in good condition. All the blood and manure run into the sewer.

Bilkovsky, Anthony, 416 Hastings street, slaughters 5 cattle per week. Every thing in good condition. Box below floor, holding about 30 gallons, and proper sewer connections. All the blood and manure run into the sewer.

Brown, James, 735 Grand River avenue, slaughters 10 cattle and 10 calves per week. Has box below floor, holding 30 gallons, with plug to pull out when the tank is full of blood, manure and water and let it run into the sewer. Everything in good condition and proper sewer connections.

Brown, Robert, 59 Brady street, slaughters 150 sheep per week. Has proper sewer connections, and box below floor holding 30 gallons, with plug in bottom. Blood runs into sewer. Manure is carted away. Everything in good condition otherwise.

Baxter, Wm., 297 Woodward avenue, slaughters 5 cattle per week. Has proper sewer connections and box below floor holding 20 gallons. Blood and manure run into sewer. Generally in good condition otherwise.

Bigley, John, & Co., foot of Twentieth street, slaughter 5,000 hogs yearly. Slaughter-house in good condition. Blood and manure run into the river.

Belknap & Drake, foot of Twenty-first street, slaughter 5,000 hogs during the fall and early part of winter. Slaughter house in good condition. Blood and manure run into the river.

Clancy, John, 407 Seventeenth street, slaughters 10 cattle per week. Has proper sewer connections, with box below floor holding 30 gallons. Floor tight. Blood and part of the manure run into the sewer. Offal fed to hogs in the yard back of slaughter-house, which makes it in a filthy condition.

Davey, Edward, 181 Michigan avenue, slaughters 3 cattle per week. Has proper sewer connections, with box below floor holding 20 gallons. Floor tight and everything in good order. Blood and manure run into sewer.

Davey, John, 269 Michigan avenue, slaughters 3 cattle per week. Has proper sewer connections, with box below floor holding 25 gallons. Floor tight and everything in splendid condition. Blood and manure run into sewer.

Daget, Frank, 999 Michigan avenue, slaughters 4 cattle per week. Has proper sewer connections, with box below floor holding 30 gallons. Floor tight and everything in good condition. Blood and manure run into sewer.

Duff, John, 893 Fifteenth street, slaughters 15 cattle per week. Has proper sewer connections. Forty gallon box below floor. Blood runs into sewer. Manure is thrown out into hog yard, also part of offal, during the cold weather, but there are no neighbors near him to find any fault. Floor is tight.

Denk, J. J., 403 Riopelle street, slaughters 25 cattle per week and 25 sheep and calves. Has proper sewer connections, with box below floor holding 60 gallons. Floor tight and the premises are in good condition generally.

Duff & Regan, 37 Humboldt avenue, slaughter 50 cattle per week. Have proper sewer connections, with box below floor holding 65 gallons. Good floor and every thing in splendid condition. Blood and manure run into sewer.

Duff & Capolis, rear of 368 Twentieth street, slaughter 100 cattle per week. Have proper sewer connections, with box below floor holding 65 gallons. Good floor. Yards planked and everything in good condition generally. Blood and manure run into sewer.

Fitzpatrick Bros., 688 Michigan avenue, slaughter 10 cattle and 125 sheep and calves per week. Have proper sewer connections, with box below floor holding 30 gallons. Good floor. Blood runs into sewer. The yard is in filthy condition but is frozen now; it should be cleaned up as soon as the frost is out, or before warm weather comes on.

Genther, Fred., 455 Grand River avenue, slaughters 5 cattle per week. Has proper sewer connections, with tank below floor holding 35 gallons. Blood and manure run into sewer. Everything neat and clean and good floor.

Gear, Peter, 290 Prospect street, slaughters 6 cattle per week. Has box below floor holding 25 gallons. The building is new and in perfect order. Blood and manure run into sewer.

Huetter, Wm., 832 Gratiot avenue, slaughters 5 cattle and 30 sheep and calves per week. Has proper sewer connections. Good floor; box below it with no plug but grate in the bottom to keep anything coarse from running into the sewer, so that nothing but blood and water get there. The floor is tight and the premises are in good condition.

Houghton & Perkins, 757 Grand River avenue, slaughter 20 cattle per week. Have proper sewer connections, with box below floor holding 160 gallons. The building is new and everything in good condition. The blood and manure run into the sewer.

Kraft, Fred., 674 Michigan avenue, slaughters 5 cattle per week. Has proper sewer connections. Good, tight floor, with box below it holding 25 gallons. Blood and manure run into sewer. Floor tight and everything kept in good condition.

Kamman, Charles, 20 Lewis street, slaughters 25 cattle per week. Has proper sewer connections. Good floor, with box below, holding 25 gallons. Blood and manure run into sewer. The place is kept in fair condition.

Kamman, Fred., 237 Cass street, slaughters 125 sheep and calves per week. Has proper sewer connections, with box below floor holding 20 gallons. Splendid floor. Everything kept in apple-pie order. Blood runs into sewer. Offal is carted away every day.

Knoch, Frederick, 460 Clinton street, slaughters 5 cattle and 5 calves per week. Has proper sewer connections, with box below floor holding 30 gallons. Blood and manure run into sewer. Good floor, and premises kept in good condition generally.

Kramer, John, 372 Chene street, slaughters 2 cattle per week. Has proper sewer connections. Good floor with box below holding 10 gallons. Blood and manure run into sewer. Good floor. Everything in proper condition at present.

Lorf, Frank, 509 Antoine street, slaughters 3 cattle and 10 sheep and calves per week Has proper sewer connections. Good floor, with box below holding 10 gallons. Blood and manure run into sewer. The premises are generally in good condition.

Loosemore, Frank, 878 Michigan avenue, slaughters 10 cattle per week. Has proper sewer connections. Good floor, with box below. No plug but grate in bottom to stop offal from running into sewer, but all the blood and manure run into it. The slaughter house is kept clean inside, but outside in the yard it is generally in a filthy condition, by throwing the offal out on the ground. There is no smell from it at present, but think there will be when the weather gets warm.

Loosemore, John, 8 Foundry street, slaughters 35 cattle per week. Has proper sewer connections. Good floor, with box below holding 60 gallons. Blood, manure and water run into the sewer. The offal is fed to hogs kept on the premises, but he intends to dispose of them this month, and have the offal drawn away every day. The premises are generally kept in good condition.

McIntire & Robinson, 394 Twentieth street, slaughter 25 cattle per week. Has proper sewer connections. Good floor, with box below holding 30 gallons. Blood and manure run into the sewer. The yards are planked. The premises are kept in a very neat and clean condition; they were built new last year.

Messmore, Phineas, 347 Fourth street, slaughters 40 cattle per week. Has proper sewer connections. Good floor, with box below holding 40 gallons. Blood and manure run into the sewer. The offal is taken away two or three times a week during the cold weather, and every day during the warm weather. The premises are kept in very fair condition.

Magee, William, 519 Grand River avenue, slaughters 40 cattle per week. Has proper sewer connections. New floor perfectly tight, box below holding 30 gallons. Blood runs into sewer. Manure is thrown into alley and taken away two or three times a week during the cold weather, and every day during the warm weather, and offal the same way, except it is left in the building until it is taken away. The slaughter-house is kept quite clean inside, but the yard and alley are in rather slack condition, although I don't know of anyone ever making complaint about it.

Morey, Thomas, 913 Cass avenue, slaughters 200 sheep per week. Has proper sewer connections. Good floor, with box below holding 75 gallons. Blood runs into sewer. Everything in perfect order.

Quimby, William, 55 Duffield street, slaughters 25 sheep and calves per week. Has proper sewer connections, with box below floor holding 15 gallons. Blood runs into sewer. Manure thrown into alley with horse manure, into box, and taken away three or four times a week. Floor tight and kept clean.

Robinson, John, Leverette street, near Seventh street, slaughters 50 cattle and 50 sheep and calves per week. Has proper sewer connections. Tight floor in slaughter-house, with box below holding 25 gallons, with grate in bottom to prevent anything coarse from entering the sewer. Manure is put in yard, back of slaughter-house, and taken away when convenient. Sometimes it lays there for two or three weeks during the cold weather, but is taken away often in warm weather. It is generally a bad place in the spring, when the frost is coming out. It is higher than the lots on Baker street, and the blood and filth that collects around there during the winter run down on the lot below, making it a nuisance for the people living there.

Rauss, John, 42 Randolph street, slaughters 10 cattle per week. Has proper sewer connections. Tight floor, with box below holding 10 gallons. Blood and manure run into sewer. It is kept clean inside, but the yard is not in such condition as it ought to be, but I think the neighbors find no fault. Think it would be a good thing for a sanitary man to visit there often.

Stiber, Frank, 620 Antoine street, slaughters 3 cattle per week. Has proper sewer connections. Tight floor, with box below holding 20 gallons. Blood and manure run into sewer. The premises are kept in neat condition.

Smith, Wm., & Son, 159 Woodbridge street west, slaughter 10 cattle and 10 sheep and calves per week. Has proper sewer connections. Tight floor, with box below holding 60 gallons. Blood and manure run into sewer. The place is generally kept in good condition.

Vogel, Frank, 407 Chene street, slaughters 25 sheep and calves per week. Has proper sewer connections. Tight floor, with box below, holding 10 gallons. Blood runs into sewer. Is kept in very good condition.

Wreford, William, 555 Jefferson avenue, slaughters 100 cattle and 400 sheep per week. Has proper sewer connections. Tight floor, with box below, holding 100 gallons. The best slaughter-house in the city, and kept in the best condition. Blood and manure run into sewer.

SECOND REPORT.

DETROIT, Feb. 9, 1882.

To O. W. WIGHT, M. D.,
Health Officer.

DEAR SIR:—I hand you the following report showing the number of slaughter-houses that have no boxes below the floor, their location, condition, and number of animals slaughtered in each, as near as possible.

Broeg, Max, 615 Gratiot avenue, slaughters 25 sheep and calves per week. Has no box, but has proper sewer connections. Offal carted away every day. Good tight floor, and is kept clean. Blood runs into sewer.

Bueckendorf, Herman, 449 Antoine street, slaughters 5 cattle per week. Has proper sewer connections. No box. Blood runs into sewer. Offal carted away every day. Floor is tight. The place is kept in good condition generally.

Beckbissinger, Fred, 593 Macomb street, slaughters 2 cattle per week. Has proper sewer connections. No box. Blood runs into sewer. Offal carted away. The floor is tight and in good condition.

Downey, John, 723 Michigan avenue, slaughters 10 cattle per week, and 10 sheep and calves. Has proper sewer connections. No box. Blood runs into sewer. Offal and manure taken away two or three times per week. Floor tight and kept clean. The cattle-yard is in filthy condition and should be cleaned up as soon as the frost is out.

Droste, Joseph, 674 Gratiot avenue, slaughters 5 cattle and 25 sheep and calves per week. Has proper sewer connections. No box. Blood runs into sewer. Offal and manure carted away nearly every day. Floor tight and generally kept clean.

Gudenau, Cornelius, 388 Orleans street, slaughters 5 cattle per week. Has proper sewer connections. No box. Blood runs into sewer. Offal and manure carted away. Floor tight and generally kept clean.

Heise, Wm., 202 Clinton street, slaughters 75 hogs per week. Has proper sewer connections. No box. Blood runs into sewer. Offal and manure carted away. Floor tight and generally kept clean.

Hilderscheit, Peter, 318 Croghan street, has slaughter-house with good floor. No box. Blood runs into sewer. When in use offal and manure carted away. It is not used at present.

Hilderscheit, John, 74 Russell street, slaughters 3 cattle per week. Has proper sewer connections. No box. Blood runs into sewer. Offal and manure taken away nearly every day. Floor tight. Kept in good condition.

Holzman, Joseph, 302 St. Aubin avenue, slaughters 3 cattle per week. Has proper sewer connections. No box. Blood runs into sewer. Offal and manure carted away. Floor tight and generally kept clean.

Herppish, Christian, 153 Prospect street, slaughters 100 calves per year. Has proper sewer connections and good floor. Blood runs into sewer. Offal and manure carted away. The place is kept in good condition.

Hammond, Standish & Co., Twentieth street, slaughter 2,000 hogs per week. Have proper sewer connections. No box. Blood and manure run into sewer from the tanks on the floor above. Good floors and everything kept in perfect order.

Kieffer, George, 193 Prospect street, slaughters 2 cattle per week. Has proper sewer connections. No box. Good floor. Blood runs into sewer. Offal and manure taken away every day. The place is kept in good condition.

Kolb, Frank, 243 Lafayette street east, slaughters 5 cattle per week. Has proper sewer connections. No box. Good floor. Blood runs into sewer. Offal and manure taken away every day. The place is kept in good order.

Lingemann, Anthony, 507 Gratiot avenue, slaughters 100 calves per year. Has proper sewer connections. No box. Blood runs into sewer. Offal carted away. The place is kept in fair condition, but needs looking after sometimes. Good floor.

May, Mrs. Victoria, 700 Woodbridge street west, slaughters 3 cattle and 20 sheep and calves per week. Has proper sewer connections, with box running from floor to sewer without any bottom to it to keep the sewer-gases from escaping into the building. Good floor. Blood runs into sewer. Offal taken away two or three times a week. Manure put into box in alley and taken away when convenient, which makes the alley in rather a filthy condition.

Mueller, Wm., 269 Gratiot avenue, slaughters 5 cattle and 5 calves per week. Has proper sewer connections. No box. Good floor. Blood runs into sewer. Offal and manure carted away. The place is generally kept in fair condition.

Maier, Charles, 716 Croghan street, slaughters 5 cattle per week. Has proper sewer connections. Good floor. No box.

Blood runs into sewer. Offal and manure carted away. The place is kept in good condition.

Miller, Peter, 382 St. Aubin avenue, slaughters 5 cattle per week. Has proper sewer connections. Good floor. No box. Blood runs into sewer. Offal and manure carted away. The place is kept in good condition.

Noack, Wm., 187 Lafayette street east, slaughters 20 sheep and calves per week. Has proper sewer connections. No box. Good floor. Blood runs into sewer. Offal carted away. Not kept in best condition; needs some looking after.

O'Rourke, Patrick, 773 Michigan avenue, slaughters 20 sheep and calves per week from February to July. Has no sewer connections. Good floor. Most of blood and all the other offal is carted away. Think he should be made to make proper connections with sewer before he slaughters any more there.

Petz, Anthony, 170 Russell street; slaughter-house all right, except there is no box below floor, but it is not in use at present, and don't know as it ever will be.

Roehl, Charles, 464 Mullett street, slaughters 3 cattle and 10 sheep and calves per week. Has proper sewer connections. No box. Good floor. Blood runs into sewer. Offal and manure carted away. Generally in good condition.

Stickel, Jacob, 195 Rivard street, slaughters 5 cattle per week. Has proper sewer connections. No box. Good floor. Blood runs into sewer. Offal and manure carted away. Place kept in fair condition.

Shevlen, Michael, 373 Sixteenth street, slaughters 10 sheep and calves per week from March to July. Has proper sewer connections. Good floor, but keeps the place in a slovenly condition. Needs looking after.

Stackpole, Thomas, 30 Washington street, has proper sewer connections. Good floor. Has quit slaughtering for the present.

Stocker, Wm., 367 Russell street, slaughters 15 cattle and 20 sheep and calves per week. Has proper sewer connections. Good floor. No box. Blood runs into sewer. Offal and manure carted away. The place is kept in rather slack condition and needs looking after. There was one complaint made against him last summer for maintaining a nuisance. I think he was convicted.

Tabert, E. A., 512 Gratiot avenue, slaughters 5 cattle and 10 sheep and calves per week. Has proper sewer connections. No box. Good floor. Blood runs into sewer. Offal and manure carted away. The place is kept in good condition.

Wood & Reid, 291 Michigan avenue, slaughter 25 cattle per week. Have proper sewer connections. No box. Blood runs into sewer. Offal carted away nearly every day. Manure put back of slaughter-house, in heap, and carted away when most convenient for the man that takes it. The place is in very good condition otherwise. Floor tight.

Voigt, Wm., 158 St. Aubin avenue, slaughters 5 cattle per week. Has proper sewer connections. No box. Good floor. Blood runs into sewer. Offal and manure carted away. The place is generally kept in very fair condition.

Webb Bros., Thirteenth st. and Grand River ave., slaughter 200 hogs per week. Have proper sewer connections. Good floor. Blood and manure run into sewer. The place is kept in good condition.

Weber, Geo. L., 199 Gratiot avenue, has proper sewer connections. Good floor. No box. Is not in use at present.

THIRD REPORT.

DETROIT, February 9, 1882.

To O. W. WIGHT, M. D.,
Health Officer:

DEAR SIR—There are two Jews at 288 Hastings street, by the name of Marx Silberman and Isaac Applebaum. They keep a meat market in front and slaughter calves and chickens in the back room. There is no sewer connection except to carry off the waste water from the penstock. The floor is in bad condition for that kind of business, only inch boards, and not very good at that. It is kept in a filthy condition, and slaughtering should be stopped at once.

George Schneider, 942 Michigan avenue, has no slaughter-house, but slaughters hogs in the back yard, some days as many as 10 or 12 of them. Blood and water soak into the ground, which I think will make a bad smell when the weather becomes warm. There is blood in shed where they have been sticking hogs and letting them bleed. A pile of bristles and ashes in the yard, and half barrel of guts has been there for several days.

Davey, Wm., 235 Michigan avenue; slaughter-house floor in bad condition. Several holes in it, and it is nearly worn out, and sewer stopped. There has been no slaughtering there since he had notice to quit.

King, Harvey, 190 Grand River avenue, slaughters 100 cattle per week, and 200 sheep and calves per week. Slaughter-house floor tight. Blood runs into sewer. Offal is fed to hogs under slaughter-house; about 50 hogs. Manure carted away about twice a week. Floor in cattle pens in bad condition; cracks one to two inches wide between the planks. Manure runs through under the building. No flush tank yet.

Mason, Wm., 351 Eighteenth street, slaughters 150 cattle and 1,200 sheep and calves per year. Slaughter-house floor tight, but no sewer except box drain running from hydrant to privy vault, then along under slaughter-house to sewer in alley. Two inch hole in floor for water and blood to run into the box drain, which is not large enough to carry off all the blood and waste water used in slaughtering.

Newman, C., 107 Twenty-second street; slaughter-house floor tight and in good condition every way, except there is no sewer connection. He has quit slaughtering, and says he will never use it for that purpose, unless there should be a sewer put in the alley.

Respectfully,

A. S. LANE,
Inspector of Meats and Provisions.

WHAT ARE THE OBJECTIONS TO THESE SLAUGHTERING PLACES?

Ask the people who live in their vicinity and they will answer with an eloquence inspired by the perpetual discomfort of noise and stench, and by the depreciation in the value of their homes. The driving of cattle to such places is a danger and an obstruction to the public streets. The noise of animals, by night as well as day, irritates the nerves and destroys sleep. Women and children cannot help seeing from windows opening upon uncovered slaughter-yards, here and there in the city, the butcher plying his trade. To many it is a distressing sight. Scenes of brutality are sometimes witnessed that shock all but the hardened. The murderous axe and the knife red with blood are not suggestive of the humanizing sympathies. The smell of offal, even when it is untainted, is repulsive; and windows on the side of the slaughter-house must be closed in summer, when fresh air is needed. The yards where animals destined to slaughter are kept become foul with excreta and send up poisonous exhalations. Not unfrequently the refuse of slaughtering putrefies before it can be removed, and adds to discomfort a source of disease. The plaintive cry of dumb creatures, that seem to have an instinct of their fate, sounds mournful to the human ear and tempers hearts to sadness that might otherwise be glad.

The depreciation of real estate in the neighborhood of slaughter-houses amounts to much more than the whole value of a business that might be conducted more profitably elsewhere. In some places the depreciation is fully one-half. The butchers have no right to tax their fellow-citizens so heavily for their own convenience. A meat market is not offensive; when kept clean and neat, it is even attractive. But no care can make a slaughtering place anything but a nuisance.

As the report of Mr. Lane shows, nearly all the slaughter houses in the city run their blood and the contents of paunches and entrails into the sewers. Blood in sewers coagulates, adheres to the rough brick walls, putrefies and evolves vast volumes of foul gases, which find their way not only to the outer air of the streets but also into habitations through imperfect drainage connections. Some very eminent sanitarians are of the opinion that the emanations of putrefying blood cause scarlet fever. All are agreed that it is one of the most potent fertilizers for promoting the growth of that dangerous disease. The blood from two hundred cattle and numerous smaller animals slaughtered every day amounts to a vast quantity during the year. It is impossible to compute how much its decomposition in the sewers adds to the unwholesomeness of the city. There is only one greater and more dangerous source of poison, and that is the washing of the contents of innumerable foul privy vaults into the great underground drainage system of the city. I do not mean the contents of water-closets, flushed with an abundance of water every time used. If the sewers were perfect such material would be carried into the great beneficent river, before undergoing dangerous putrefaction. No amount of water can wash out blood. It sticks to the sewers and remains till it rots away.

And it is impossible for the public health authority to inspect all animals slaughtered daily in seventy or eighty places scattered all over the city. Many of the butchers are conscientious men and will not slaughter animals that are diseased. Some are indifferent. A few would run the risk of scattering disease and possible death among their fellow-creatures in order to make a little more profit on the sale of meat. All slaughtering should be done where a skilled Inspector can determine whether the animals are in fit condition for human food. The public knows but little about the condition of the cattle and other animals when led to the slaughter and destined for the table. As illustrating this point, I take a single article from a newspaper. The Chicago *Journal*, published in the great centre of trade in cattle and swine, says:

CRUELTY TO ANIMALS IN TRANSIT

has become so shocking of late years that public attention is being attracted to it, and a loud demand is being made in all quarters for a reform. The New York *Tribune* published an article in its last Sunday's issue concerning the treatment of cattle, sheep and hogs in their passage from Chicago and St. Louis to the eastern market, which, if true—and there is little doubt about it—ought to arouse public indignation to a pitch that would force Congress to pass a stringent law on the subject. Here are some extracts from the article referred to:

"Some idea of the condition of the animals on arriving at Chicago may be formed when it is known that the dead hogs average fully one to a carload, and this when the weather and other conditions are favorable, while a careful inspection of the books of the railroads show that the dead cattle, including those which are so badly crippled as to have no greater commercial value than if dead, average about five per day. These dead animals include only those which have died since leaving the last preceding feeding station, where the dead and badly wounded were not re-loaded. If by a supreme effort, induced by extreme torture and a desire to accompany its companions, the animal can rise to its feet and leave the car, the animal is classed as sound. I saw a poor creature, after repeated and most desperate efforts, succeed in rising to its feet, after it had been dragged from the car, and, trembling violently in every part of the body, it was finally able to follow its companions. The shouts and thrusts of the attendants in another car that had just arrived at the yards had no effect upon a steer which had been forced down and trampled upon by its comrades until it was severely wounded, but a dexterous twist of the tail, giving a violent shock to the spinal column, started the animal, and it gave a last desperate effort to rise, but in vain, and further twisting of the tail and kicks and shouting were of no avail. Unable to hold its head up longer, it submitted quietly to all the cruelty that was practiced upon it. It was dying. The records show that the number of those that reach the Chicago yards in this condition is greater than that of the actually dead. Broken horns, with the blood dripping from them, and other evidences of injury, are seen on almost every train."

The manner of loading these poor dumb creatures on the cars is thus described:

"By shouting and prodding the cattle are frightened and forced through the chute into the car until it is full. As the car fills up the unfortunate animals that happen to be among the last are compelled by thrusts of a sharp iron pike or prod, as it is called, to force their way into the car that, at least at the door, has not an inch of space left. The legs of one or more of the animals get caught between the car and the platform of the chute, and from that position they have to extricate themselves, and at the same time force their way into the car, a work that is effected only after earnest prodding and vigorous twisting of the tail. Thus frightened and crowded, and almost thrown from their feet by the bumping and jerking in the making up of the train, they start. As we pulled out of Chicago the first task of the cattle men, who were seated in the caboose at the end of the train, was to sharpen their prods. These prods consist of a pole four to six feet long, with a sharpened nail at the end about an inch in length."

The condition of the cattle on the train which the writer accompanied through from Chicago to New York is described below. There was one stop at Buffalo for food and drink. He says:

"That 27 car-loads which reached New York on Monday night were killed Tuesday morning. When the hides were stripped great clots of blood were found about the head, neck and shoulders, and particularly on the rumps—where the animals had been prodded, 'horned' and bruised by rubbing against the cars. These clots were carefully cut away by the expert butchers, but the mark of the cutting still remained. The loss in weight of the 27 car-loads (403 cattle) between Chicago and New York was 25,780 pounds, or about 64 pounds per head."

This recital of brutality, of which the above brief extracts furnish only an indefinite idea, has aroused Mr. Henry Bergh, the well-known humanitarian of New York, who considers another important phase of the cattle transportation question, and asserts that every one admits that the flesh of these bruised, beaten and frightened animals is not healthy food. He says: "The truth should be known, however, to the consumers of the flesh of these sick and dying animals, starved and pounded during a journey of many days' duration. On arrival at their places of destination they are at once driven into the slaughter-houses, almost frantic from the consequences of the treatment which so-called civilized beings have made them endure, burning with fever, lame and covered with deep-sunken ulcers, and there are killed and dressed for the market; and horrible to think of, the meat is perhaps on the next day placed upon the tables of the citizens and restaurants of the city, and eaten and absorbed by its apathetic or unsuspecting consumers. Familiarity with these soulless and disgusting proceedings has almost converted the writer into a strict vegetarian. He has seen the carcasses of animals suspended in the abattoirs in and around New York, awaiting transportation to the markets, which exhibited revolting sores and ulcers, sometimes a foot in diameter."

In answer to the question, "What are you going to do about it?" Mr. Bergh says:

"Three remedies are practicable in case the people see fit to wake up from their slumber: (1) Rebellion against the railroad tyrants by forcing a stringent law through Congress compelling these corporations to change this system of cattle transportation entirely, and placing the enforcement of that law either in the hands of government officials, or in those of the societies for the prevention of cruelty to animals, along the whole route of transportation, reimbursing them their expenses. (2) By obliging stock companies to slaughter the animals near their grazing grounds, and bring the meat to market in refrigerator cars. (3) In case these are not attainable, the refraining from the use of meat altogether."

Outside of its shameful inhumanity, the business of transporting cattle by rail is an important one from the hygienic point of view, which deeply interests the consumers at the east.

There is another remedy which Mr. Bergh does not mention. Every city should be provided with one or more *public abattoirs*, in the open country adjoining, to which are attached wide fields for summer, and vast sheds for winter use, in which cattle can be fed and cared for in a humane way, until they entirely recover from the fever, injuries and fright of a long journey, before they are slaughtered for food. Whether the cattle arrive in cars or in droves, they should be kept, under conditions of health, until a skilled Inspector pronounces them fit for slaughter. All the minor stock-yards now in Detroit should be done away with; they would not be required if the butchering places were closed. Ample grounds somewhere between the new stock-yards at the Junction and the river, ought to be secured for an abattoir, in which all the slaughtering for the meat markets might be properly done. It should be controlled by an association of butchers and be under the supervision of a skilled Inspector. All the people who use the meat cannot be there to look after their interest and safety, but should be represented by a competent and trust-worthy official.

The Common Council has power under the charter to drive all slaughtering from the City, but has no authority to grant privileges and impose restrictions on an abattior company, outside of the limits. An act of the Legislature will therefore be necessary to place the meat supply of Detroit on a safe and proper basis. In order to make my views on the subject more explicit and clear, I here present a draft for such a measure, and hope a more skilled hand will put it in proper shape for the consideration of the State Legislature next winter.

A BILL

to incorporate the Butchers' Slaughtering, Melting and Cattle-Yard Association of Detroit, and for other purposes.

The People of the State of Michigan enact:

SECTION 1. Wm. Wreford, Harvey King, Wm. Smith, John Bigley, James D. Standish, and Leonard B. Crocker, their associates and successors, are hereby made a corporation by the name of the Butchers' Slaughtering, Melting and Cattle-Yard Association, to be located in the County of Wayne, outside of the present limits of the City of Detroit, and not more than four miles therefrom, for the purpose of carrying on the business of buying, slaughtering, and yarding cattle, sheep and other animals, and of melting and ' rendering," subject, however, to the provisions hereinafter contained, and to all general laws now or that may hereinafter be in force applicable to such corporations.

SEC. 2. Said corporation may take and hold, by purchase or otherwise, such parcel of land, not exceeding two hundred and forty acres in extent, and situated in the County of Wayne, outside of the present limits of the City of Detroit, and not more than four miles therefrom, as the Board of Health, Mayor and Controller of the City of Detroit shall determine to be suitable for the carrying on of said business; and said corporation shall, within sixty days from the time it shall take any land otherwise than by purchase, file, in the office of the Register of Deeds for said County of Wayne, a description thereof, as certain as is required in a common conveyance of lands, together with a statement of the purpose for which the lands are taken, which description and statement shall be signed by the President and Secretary of the corporation.

SEC. 3. The said corporation shall be liable to pay all damages that shall be sustained by any persons in their property by the taking of any land for the purposes of this act. Any person who shall sustain damages, as aforesaid, and who shall not agree upon the damages to be paid therefor, may apply by petition for the assessment of his damages, at any time within one year from the taking of said land, to the Circuit Court of Wayne County. Such petition may be filed in the Clerk's office of said court in vacation or in term-time; and the clerk shall thereupon issue a summons to said corporation, returnable if issued in vacation to the then next term of the said court, held fourteen days at least after the issuing of said summons, and, if in term-time, returnable on such day as the court shall order, to appear and answer to the said petition. The said summons shall be served fourteen days at least before the return day thereof, by leaving a copy thereof with the clerk of said corporation; and, upon the return of said summons, duly served, the said petition shall stand as a cause in said court; and all questions of fact relating to the damages sustained by the petitioner shall be heard and determined, and the amount of such damages shall be assessed by a jury of said court, unless the parties shall in writing waive their right to a jury-trial, and agree that the question of said damages shall be determined by the court; and the verdict of said jury, being accepted and recorded by said court, or the award of the court if jury-trial shall be waived, shall be final and conclusive, and judgment shall be rendered and execution issued thereon; and costs shall be recovered by the petitioner if the amount of said judgment shall exceed the amount offered him for his damage by said corporation before the filing of said petition; otherwise said corporation shall recover its costs.

SEC. 4. Said corporation shall proceed to build upon said land suitable buildings for the slaughtering of cattle, sheep and other animals, and for melting and rendering purposes, and all necessary stables, yards and out-buildings. But no building shall be erected until the plans therefor with all details of construction shall have been submitted to and approved by said Board of Health, Mayor and Controller of the City of Detroit. All the business of said corporation shall be carried on in accordance with such regulations as said officers shall from time to time establish, and furnish in writing to the clerk of said corporation; and, for each violation of any one of said regulations, said corporation shall be liable to a fine of not less than twenty nor more than five hundred dollars, to be recovered by indictment against said corporation. Subject to the foregoing provisions, said corporation may manufacture and sell any of the usual products of said slaughtering and melting business, or may lease or permit other persons to use their buildings or parts thereof on such terms as may be agreed upon. And each member of said corporation shall have the right to slaughter on said premises, subject to such regulations and such tariff of prices as said corporation may by vote at any regular meeting establish, and to the regulations of the said Board of Health, Mayor and Controller of Detroit as aforesaid. And any person engaged in slaughtering or other business on the premises of said corporation, who shall violate any of the said regulations of said officers, shall be liable to the penalty hereinbefore affixed to violation thereof by said corporators.

SEC. 5. The capital stock of said corporation shall consist of two hundred thousand dollars, to be divided into shares of one hundred dollars each; and said corporation shall not take any land, as hereinbefore provided, or commence business, until the sum of fifty thousand dollars, at least, shall be paid in in cash.

SEC. 6. The territory comprised by the lands of said corporation, taken as hereinbefore provided, shall be and is hereby made part of the municipal corporation of the City of Detroit, and subject to all the regulations thereof.

SEC. 7. From and after the first day of June, eighteen hundred and eighty-four, the business of slaughtering and yarding animals and "rendering" shall not be conducted within the limits of the City of Detroit, except upon the premises of the Butchers' Slaughtering, Yarding and Melting Association in said city.

SEC. 8. The said association shall, within a reasonable time, slaughter all cattle, sheep, hogs and calves, which may be brought to their premises for that purpose by persons not occupying tenements therein, whenever the accommodations under their control on said premises will permit. They shall also prepare the meat and other products of such animals for the market. They may charge, in addition to the offal from such animals, such price per head as may be mutually agreed upon; and in case of disagreement as to price, the same shall be fixed by the Board of Health, Mayor and Controller of the City of Detroit.

SEC. 9. Said Board of Health, Mayor and Controller of the City of Detroit are hereby authorized to appoint one or more Inspectors to see that the rules and regulations for the conduct of the business of the association for the time being are fully obeyed by said association and their tenants, and also to see that none but healthy animals are slaughtered; the salary or salaries of said Inspector or Inspectors to be established by the Common Council of the City of Detroit. The said Inspector or Inspectors shall at all times have access to the premises of said association, and any building thereon, and also to the premises, yards, or cars of any railroad company within the City of Detroit, for the purposes of examination, inspection and seizure of any meats and animals unfit for human food.

SEC. 10. Said Board of Health, Mayor and Controller of the City of Detroit are hereby authorized to make whatever regulations may seem to them fit in order to prevent the slaughter and sale of animals unfit for human food.

SEC. 11. Any meat brought to the City of Detroit for sale, except from the slaughter-house of said corporation, shall be first taken by the owner thereof to the Central Market for inspection by the proper officer, before the same shall be sold or offered for sale. The penalty for violation of this section shall not be less than one hundred dollars nor more than five hundred dollars, or imprisonment in the Detroit House of Correction not less than thirty nor more than sixty days.

The reports of Mr. Lane resulted in orders served on several butchers to put their premises in proper condition, as required by law, or to cease slaughtering. Two or three quit the business, and the rest complied with the regulations. The law has not yet been applied in its full rigor. If unreasonable opposition shall be made to the plan of removing all slaughtering from the city to a public abattoir, controlled, under proper sanitary inspection, by an organization of butchers, the provisions of the ordinance will be enforced according to the exact letter. In an abattoir, properly constructed, all waste material from slaughtering, blood, horns, hoofs, bones, refuse, grease, etc., can be manufactured into saleable products without causing any nuisance to the neighborhood. Gut-cleaning, manufacturing of glue, bone-boiling, preparation of fertilizers, curing of hides, soap-boiling, and other "offensive trades," will naturally follow the slaughtering. The profits will thereby be increased to the butchers and the city will be relieved from a multitudinous nuisance.

A majority of the meat markets in the city have no slaughtering places connected with them. The proprietors purchase their meat by the carcass from the wholesale dealers. They are generally kept clean and give the Inspector very little trouble. If an abattoir can be built, we shall in due time have only well regulated meat markets, and no slaughter-houses in the whole city. Business will not be injured thereby, but decidedly benefited. A majority of the people would greatly rejoice.

ABATEMENT OF NUISANCES.

"*Among causes which injuriously affect the public health, considered as a total, certain operate only in particular districts: as, for instance, some large adjacency of malarious or water-logged land, or some prevalent injurious industry; while others, though no doubt in widely different degrees, appear to be of general, perhaps nearly universal, operation. Foremost in the latter class, and constituting, in my opinion, objects which claim earliest attention in the sanitary government, two gigantic evils stand conspicuous,—*

"*First, the omission (whether through neglect or through want of skill) to make the due removal of refuse-matters, solid and liquid, from inhabited places; and,*

"*Secondly, the license which is permitted to cases of dangerous infectious diseases to scatter abroad the seeds of their infection.*

"*In certain very important cases, injury—immense injury—accruing to the public health, arises from a co-operation of these two evils: arises, namely, through the special facility which certain forms of local uncleanliness provide for the spreading of certain specific infections; and the influence which uncleanliness almost necessarily exerts in that way against the public health, makes so large an addition to the influence which it exerts in other ways, that, in total power, uncleanliness must, I think, without doubt, be reckoned as the deadliest of our present removable causes of disease.*"—JOHN SIMON.

ABATEMENT OF NUISANCES.

For the double purpose of explaining as clearly as may be the administrative method adopted by the Health Office for the removal of those unsanitary conditions in the city, generally called nuisances, and of separately publishing in as practical a manner as possible, the public health ordinances, I have given the essential parts of blanks used constantly in such work. Whenever a citizen comes into the health office to obtain the services of the department for the removal of any annoying or injurious nuisance, whereby the comfort or health of himself and family are disturbed or threatened, his complaint is rapidly noted by filling out a blank kept for that purpose. The following is the form in general use:

Form 1--B. of H. No. ——

HEALTH DEPARTMENT OF THE CITY OF DETROIT.

OFFICE IN CENTRAL MARKET BUILDING.

DETROIT,..............................188 .

Mr. ...., of

No. .... street,........................ ward,

complains and charges that Mr. ....

.... of

No. .... street,........................ward,

....

....

....

....

Order ....

Further order.. 188 .

....

Action.. 188...

As the printed blank is spread out on half a leaf of legal cap paper, the intermediate spaces are ample for noting all the details of complaint. The date is first entered, then the name and address of the complainant, then the name and address of the party complained of, then the location and specific nature of the complaint. The name of the complainant is not divulged by the office, unless the matter should result in prosecution, when the one making the charge will be needed as a witness. No order to abate a nuisance is ever issued on the charge of the complainant alone. The first entry under the word "order" in the blank is to an officer of the department, to make a personal inspection of the thing complained of, and to make a written report to the Health Officer. Members of the sanitary squad of Police usually make the inspection and report. Such written report, if properly and clearly made, is endorsed as approved and pinned to the complaint. Experience shows that an officer inspects much more carefully and precisely, if he has to state in writing what he finds, and has to attach his name to his report, for permanent record.

The Health Officer judges from the record before him what kind of an order should be issued to the person responsible for the existence of the nuisance. If he is in doubt, or does not understand the matter clearly, he makes a personal investigation before issuing an order to abate. Sometimes a notice is sent to the delinquent citizen to come to the Health Office for consultation in regard to the thing complained of. When a graver charge is made, the Health Officer thinks it his duty to give the citizen an opportunity to explain, before proceeding to the extremity of a prosecution. Not only is legal conflict generally obviated in that way, but also, not unfrequently, is hearty and intelligent co-operation secured in sanitary work.

The following blank is very frequently used in issuing an order to abate nuisance:

Form 11--B. of H.

HEALTH DEPARTMENT OF THE CITY OF DETROIT.

OFFICE IN CENTRAL MARKET BUILDING.

DETROIT,..188 .

To...

You are hereby notified and ordered, as owner, agent or occupant of the premises known as..

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....

within.....................................days from the date of service hereof, according to the requirements of an ordinance of the City of Detroit, entitled "An Ordinance concerning the duties of the Board of Health of the City of Detroit, and providing for the maintenance of the public health," approved August 16th, 1881, whereof sub-clause 12, of section I, section XVIII, and section XXI, read as follows:

SECTION 1 (12). Whenever, in their judgment, it shall be necessary for the public health, the said Board may at once take possession of any building, factory, hotel, dwelling-house, out-house, premises or grounds, upon which, in their judgment, there exists any nuisance prejudicial to the public health; and if the owner or occupant shall refuse or neglect to forthwith abate such nuisance in the manner directed by said Board, said Board may cause the same to be abated forthwith in such manner as they deem proper, and all expenses incurred shall be a legal claim against the owner and a lien upon the premises, to be collected in the same manner as other special assessments. The said Board may also, when they deem it requisite for the public health, at once, and by force if necessary, close up such houses, buildings, hotels and premises, and exclude all occupants therefrom until such nuisance shall be fully abated, and the air of such building or premises is thoroughly purified. Any person who shall resist the action of the Board, or their agents under this subdivision, shall be liable to penalties hereinafter provided.

SEC. 18. The said Board and its Health Officer shall have authority to discharge all the duties relating to the health and sanitary condition of said city, now or heretofore discharged under any existing ordinance by any other officer of said city.

SEC. 21. Violation of, or failure to comply with the provisions of this ordinance, or failure or neglect to comply with any of the requirements of the Board of Health, shall, on complaint to the Recorder's Court, be punished by a fine not to exceed five hundred dollars and costs, and in the imposition of any such fine and costs, the Court may make a further sentence, that the offender be imprisoned in the County Jail or Detroit House of Correction, until such fine and costs be paid: Provided, however, that the term of such imprisonment shall not exceed the period of six months.

By order of the Board of Health.

——— ———, M. D.,
Health Officer.

This form is used for various purposes. As the blank is on a whole page of legal cap paper, there is ample space to write out the order in detail. To abate a nuisance of stagnant water by filling with clean earth, by draining into the public sewer, or by both filling and draining; to connect premises with the public sewer, by means of cement or vitrified pipe, tightly laid and securely trapped, so that occupants thereof can get rid of slops, wash-water and other offensive liquids, without throwing the same onto the ground or into the street, thereby causing nuisance; to mend the plumbing of a building in such a manner as to prevent a nuisance of sewer-gas therein; to remove from buildings and the surrounding premises accumulations of decaying and therefore dangerous refuse; to clean up and whitewash a foul hog-pen or filthy cow-stable; to conduct an "offensive trade," like soap-boiling, glue-making, or grease-rendering, with such apparatus and care as to make no common nuisance to the neighborhood, or to quit the business; these and many other things are formally required by issuing orders on this blank.

The blanks are filled out in duplicate. The officer, usually one of the sanitary squad of Police, serving the same, delivers one copy to the person to whom the order is addressed and makes his returns of service on the other copy, which he re-delivers to the Health Office. There is a blank on the back of the order, for the officer to make his returns of service. The copy thus returned is attached to the complaint and report, already described, when the papers are filed away, and carefully indexed. By means of the index, the papers in any nuisance case can be found in a moment. Thus there is preserved an available record of all such transactions in the Health Office.

Some people, without duly considering the matter, have objected to the word "order" in the blank. The Board of Health is empowered, not only by the Common Council of the City, but also by the Legislature of the State, to make regulations, to enact by-laws, in all sanitary matters within its jurisdiction. Its powers are not merely permissory and advisatory, but mandatory. All acts of a mandatory governmental agency are in the nature of orders to be obeyed. Such are the ordinances of the Common Council. It is not the Health Officer, nor the members of the Board of Health, who issue an order to abate a nuisance, in their individual capacity. It is the City of Detroit, the organic community, that commands the individual citizen to obey certain sanitary regulations for the general good. The State, the commonwealth of Michigan, in its organic capacity, through its constitutional representatives, has clothed the City of Detroit, a local community, organized for local purposes, with the authority to require of individuals specific acts for the public security or benefit. The proper agency speaks and acts for the organic local community, and to find fault with the customary language of authority exercised within its legitimate sphere and under its delegated powers, is either to use the speech of insubordination, or, more generally, to utter words devoid of consideration and reflection. Sanitary laws have been enacted, sanitary ordinances have been passed; like other laws and ordinances, to be obeyed. The sanitary agency, to wit, the Board of Health and its Health Officer, must execute these laws and ordinances. It is not their duty to simply advise an individual who is found maintaining a nuisance dangerous to the health, possibly to the life, of others, to abate the same, but to direct him to do it, with an order that has the penalty of just law behind it.

The procedure of the health authority must be somewhat arbitrary in form, from the nature of the subjects with which it has to deal. The public demands that a nuisance shall be abated without delay. The law of nuisance is perhaps as well settled as any other equally complex branch of the law. The Common Law, and especially the statutes of a sovereign state, determine what things are nuisances. A Health Officer cannot make a thing a nuisance which is not already a nuisance under the law. By his oath of office he is required, when a nuisance injurious to the public health comes under his observation, to take steps to abate it. Statutes, ordinances and court decisions determine for him the method to be pursued. An order is issued to the citizen to abate the nuisance. As a help to the citizen, the order usually contains a printed copy of the law violated, or supposed to be violated. The order is not an adjudicated finality, to be executed by the Sheriff like a decree of court. The citizen to whom the order is issued is by no means deprived of his "day in court" by it. In fact, a Health Office order is only a form of notice prescribed by ordinances and statutes. If the citizen neglects such notice, the sole way of enforcing it is by judicial proceeding, is to give him his "day in court." Whether the thing designated in the order exists at all, whether, if it exists, the law makes it a nuisance, whether the manner directed to be pursued in its abatement is reasonable, are questions of fact and law, to be determined by a court or jury, or both, upon proof presented.

Many complaints are made, especially by occupants of tenement houses and business places, of foul privy vaults and the sewer connections therewith. An especial form of order to owners or agents of such property, after complaints are verified by inspection, to abate the nuisance, is used. On the blank is printed all the existing provisions of ordinances in such case made and provided. The time allowed by law for abating the nuisance is six days. The following not only exhibits this feature of the order, but embodies all the law now in force on the disagreeable subject:

Chapter LXXXIV, of the Revised Ordinances of the City of Detroit, reads as follows:

SECTION 1. No person shall follow the business or occupation of a Scavenger without a license from the Mayor.

SEC. 2. The Mayor is hereby authorized to license proper persons to act as Scavengers, upon their paying into the city treasury the sum of one dollar, and executing a bond to the corporation, with one or more sufficient sureties, conditioned for the faithful observance of the charter and ordinances.

SEC. 3. Such Scavengers, under the direction of the Mayor, an Alderman, or a member of the Board of Health, shall have power to enter upon any premises, between sunrise and sunset, and examine any vault, sink, privy or private drain.

SEC. 4. Whenever, in the opinion of the Mayor, an Alderman, or a member of the Board of Health, or sanitary Policemen, any sink, privy or private drain shall need cleaning, altering, relaying, or repairing, in order to protect the public health, he shall notify, in writing, the owner or occupant thereof to cause the same to be cleansed, altered, relaid or repaired, within six days from the date of the service of such notice, and in case of the neglect or refusal to comply with the requirements of such notice, the Common Council may direct the proper officer to cleanse, alter, relay or repair such sink, private drain or privy, and assess the expense thereof on the lot or premises attached thereto, which assessment shall be a lien on such lot or premises, and be collected in the same manner as other assessments imposed by authority of the Common Council.

SEC. 5. Scavengers shall not empty or remove therefrom the contents (except in substances not soluble in water) of any tub, vault, sink, privy, privy box, cess-pool or private drain, and transport the same through any of the streets, avenues, alleys, or other public places of the City of Detroit, otherwise than by means of some air-tight apparatus, pneumatic or other process, so as to prevent such contents as are above mentioned from being agitated or exposed in the open air during said process of emptying, removal or transportation: Provided, however, that during the months of December, January and February the contents of any privy, vault, tub or sink may be removed in any tight or closely covered box or vessel.

Scavengers shall not dispose of such contents to any person or persons who intend to use the same for manure upon any garden or other grounds within the limits of the City of Detroit; and all persons are hereby prohibited from using the contents of any privy for the purpose aforesaid within the limits of said city; and all persons are hereby expressly prohibited from removing privies from one position of a lot to another, unless by the written consent of the President of the Board of Health or of the member of the Board of Health from the ward in which said removal is proposed, and such consent shall not be given unless the privy, when removed to a new location, shall be thoroughly drained, by connection with a sewer, if practicable, and the old vault emptied of its contents and filled with earth.

SEC. 6. When requested, the Scavengers shall cleanse or empty any vault, sink, private drain or privy, and remove any and all nuisances. They may demand and receive their fees for such services in advance.

SEC. 7. The Scavengers shall receive twelve cents for each cubic foot of the contents of any sink, private drain, vault or privy, by them cleaned out or removed; and for removing any dead dog, cat, hog or other animal, or other nuisance, they shall receive such fees as may be, from time to time, fixed by resolution of the Common Council.

SEC. 8. Any violation of, or neglect or refusal to comply with the provisions of this ordinance, shall be punished by a fine not to exceed fifty dollars and costs of prosecution, and in the imposition of any fine and costs, the court may make a further sentence that the offender be imprisoned until the payment thereof: Provided, that the term of such imprisonment shall not exceed the period of six months.

And also according to the provisions of sections 15, 16, 17, 18, and 19, of Chapter LXXXVI, of Revised Ordinances of Detroit, which read as follows:

SEC. 15. Every dwelling house, store, manufactory or shop hereafter built in the City of Detroit, shall be provided with a suitable privy, the vault of which shall be walled up with two-inch plank, brick or stone, and be sunk at least four feet below the level of the earth. The inside of such vault shall be at least one foot distant from the line of every adjoining highway, street, lane, alley or lot; and when there is a public sewer within one hundred feet of such privy, it shall be so constructed as to be drained into such sewer.

SEC. 16. The Mayor, Aldermen of the city, and members of the Board of Health, shall have the power, and it is hereby made their and each of their duty, upon being satisfied that any store, manufactory, shop or dwelling house, as aforesaid, is not provided with a suitable privy, as provided in the last section, to notify, in writing, the owner or occupant of such dwelling to construct such a privy within twenty days from the date of service of such notice; and if such owner or occupant neglect or refuse to comply with the requirements of such notice, within the time specified, the Common Council may cause a suitable privy to be constructed for such dwelling house, and the expense thereof shall be charged as a special tax or assessment on the dwelling house and ground attached thereto, to be levied and collected in the same manner as other assessments imposed by authority of the Common Council.

SEC. 17. No privy shall be emptied between the fifteenth day of June and the fifteenth day of September, unless by the written permission of the Mayor, an Alderman or a member of the Board of Health. Privies shall be emptied between the hours of ten P. M. and three A. M., and at no other time: Provided, that privies may be emptied at any time without such permission by what is known as the "pneumatic odorless excavation process."

SEC. 18. Any cart, wagon or other vehicle, used or intended to be used for the purpose of conveying swill, offal, garbage excrement, ordure or night soil, shall be perfectly tight and covered, so as to prevent the contents thereof from leaking or spilling; and such cart, wagon or other vehicle, when not in use, shall not be allowed to stand in any highway, street, lane, alley, public space or square.

SEC. 19. Any violation of the provisions of this ordinance shall be punished by a fine not to exceed one hundred dollars, and the cost of prosecution; and in the imposition of any fine and cost, the court may make a further sentence, that the offender be imprisoned in the Wayne County Jail, or the Detroit House of Correction until the payment thereof: Provided, however, that the period of such imprisonment shall not exceed the term of six months.

N. B.—These provisions of previous ordinances are modified by section 18 of an ordinance entitled "An ordinance concerning the duties of the Board of Health of the City of Detroit, and providing for the maintenance of the public health," approved August 16th, 1881, which said section reads as follows:

SEC. 18. The said Board and its Health Officer shall have authority to discharge all the duties relating to the health and sanitary condition of said city, now or heretofore discharged under any existing ordinance by any other officer of said city.

By order of the Board of Health.

——— ————, M. D.,
Health Officer.

The defects of these regulations have been fully discussed in the chapter of this report, on the sewerage and house drainage systems of Detroit.

When complaints are made of the unsanitary condition of meat-markets and slaughter-houses, they are referred to the Meat Inspector, who reports thereon to the Health Officer, in the same manner as members of the sanitary squad of Police report in cases of other kinds of nuisance. As the result of such complaints and inspections, a considerable number of orders have been issued, to put such places in proper order, according to the requirements of law, or to discontinue the business. The following ordinances and parts of ordinances, embracing all that are now in force on the subject, are printed on the orders issued, as an essential part thereof:

Sections 1, 2, 3 and 4 of Chapter LXXVI, of the Revised Ordinances of the City of Detroit, read as follows:

SECTION 1. No person shall keep or continue any stall, booth, or stand in the City of Detroit, for the sale of fresh meat, without a license from the Mayor, as provided in the next section.

SEC. 2. The Mayor is hereby authorized to grant a license to any resident of the City of Detroit to keep a stall, booth or stand in the City of Detroit, for the purpose of selling fresh meat, on such person paying into the City Treasury the sum of five dollars, and executing a bond to the City of Detroit, in the penal sum of two hundred dollars, with one or more sureties, conditioned that he will faithfully observe the provisions of this ordinance.

SEC. 3. It shall be the duty of any person licensed under this ordinance, to keep his stall, booth or stand in a clean and orderly condition.

SEC. 4. No person licensed under this ordinance shall sell, or expose for sale, any unwholesome, emaciated, blown, stuffed, tainted, bruised, putrid, unsound or measly meat, poultry or provisions; or keep or expose for sale any fresh meat in any wagon, cart, vehicle or other place than that covered by and clearly designated in his license.

Or of Sections 8, 9 and 10, Chapter LXXXVI, of said ordinance, which read as follows:

SEC. 8. Every person slaughtering beeves, sheep or other animals within the City limits, shall cause the house, yard or place where such killing is done, to be provided with a tight plank floor, or to be paved with brick or stone; and if paved the earth below shall be sufficiently solid to prevent its becoming the receptacle of the filthy or offensive matter; such floor or pavement shall be so constructed as to carry off into a tub or reservoir all clotted blood and offal. At the end of each day when killing has been done on the premises, and at the end of each day when, for any other cause, any clotted blood, offal or other offensive material or garbage, shall have accumulated on the premises, the occupant shall cause the premises to be thoroughly washed and cleansed, and shall also cause the contents of said tubs, vessels or reservoirs, and all other offal, garbage and offensive matter on the premises, to be conveyed to some place without the City limits, and no such occupant shall suffer or permit the contents of such tubs or vessels, or such offal, garbage or other offensive matter, to be emptied into any public or private drain or sewer within the City limits.

SEC. 9. Every slaughter-house in this City shall be whitewashed inside at least once in each month, between the first day of April and the first day of November.

SEC. 10. No person shall allow any green or salted hides to remain on any street, sidewalk or other open place within this City longer than one hour.

The maximum penalty is a fine of $100 and costs, for nonpayment of which the Court may sentence to six months' imprisonment.

N. B.—These provisions of previous ordinances are modified by section 18, of an ordinance, entitled "An Ordinance concerning the Board of Health of the City of Detroit, and providing for the maintenance of the public health," approved August 16, 1881, which said section reads as follows:

SEC. 18. The said Board and its Health Officer shall have authority to discharge all the duties relating to the health and sanitary condition of said City, now or heretofore discharged under any existing ordinance by any other officer of said City.

By Order of the Board of Health.

——— ———, M. D.,
Health Officer.

The defects of these ordinances are especially pointed out in the chapter of this report on the slaughter-houses of this city.

Complaints of the commoner classes of nuisances, such as throwing slops or refuse in streets and alleys; leaving dead dogs, cats and other animals on premises; washing carriages on sidewalks; keeping stinking garbage near habitations, etc., etc., are usually referred to the sanitary Policemen, who issue minor orders of their own and abate the nuisances without further trouble to the Health Department. Occasionally a sanitary Policeman strikes an unreasonable sanitary sinner and reports the matter to the Health Officer. In such case, usually obviating the necessity of prosecution, an order is issued, on which is printed all the existing legal regulations on the subject, as follows:

Sections 1, 2, 3, 4, 5, 6, 7 and 19, of Chapter LXXXVI, of the Revised Ordinances of the City of Detroit, read as follows:

SECTION 1. No person shall, himself or by another, throw, place, deposit or leave in any street, highway, lane, alley, public space or square, any animal or vegetable substance, dead animal, fish, shells, shavings, paper, dirt, rubbish, excrement, filth, ordure, slops, unclean or nauseous water, liquor or gaseous fluids, hay, straw, ashes, cinders, soot, offal, garbage, swill or any other article or substance whatever. In the case of any alley where any substance above named shall exist, be, or have been deposited, it shall be the duty of every owner or occupant of any lot or premises within twenty-four hours after having been notified by the Superintendent of Police so to do, to remove from the half of said alley adjoining such lot or premises, all such substance. All fluids pumped or taken from any of the gas pipes within said city, shall be pumped or conveyed through a hose, or other proper conductor, directly into some public sewer, or in lieu thereof, to be conveyed in a vessel, closely and securely covered, to some public sewer, and the contents emptied therein.

SEC. 2. No distiller, dyer, machinist, manufacturer or other person, shall himself, or by another, discharge out of, or from any still-house, dye-house, work-shop, factory, machine-shop, dwelling-house, kitchen, or other building, any foul or nauseous liquid water, or other substance into or upon any highway, street, lane, alley, public space or square, or into any adjacent lot or ground, or force or discharge into any public or private sewer or drain, any steam, vapor or gas. No person or persons shall permit on his, her, or their premises, within the boundaries of said city, or within one-half mile therefrom, of which he, or she, or they may be the occupant or occupants, agent or agents, having charge thereof, a soap or candle factory, or the exercise of any other unwholesome or offensive trade or calling, or suffer any building, sewer, or other thing whatsoever to remain on said premises until, in any manner, the same shall become offensive, hurtful, dangerous, or unwholesome to the neighborhood or travelers.

SEC. 3. No person shall keep, place, or have, on or in any private house, lot or premises in the city, or within one mile distant therefrom, any dead carcass, putrid, offensive, or unsound beef, pork, fish, hides, skins, bones, horns, stinking or rotten soap, grease, tallow, offal, garbage or other animal or vegetable matter or substance which may cause any unwholesome, noisome or offensive smell.

SEC. 4. When any dumb animal shall die within the limits of the City of Detroit, the owner or person in possession of it shall, within twelve hours thereafter, cause the carcass to be removed to the place provided by the Common Council, or one mile beyond the city limits.

SEC. 5. No owner or occupant of any grocery, cellar, tallow-chandler shop, soap, candle, starch or glue factory, tannery, butcher-shop, slaughter-house, stable, barn, privy, sewer or other building or place, shall allow any nuisance to exist or remain on his or her premises; nor shall any person, persons or corporation, operating, owning, occupying or using any public or private street, alley, way, or any premises whatever, within the limits of the City of Detroit, create or maintain any nuisance thereon.

SEC. 6. The keeper of any livery or other stable shall keep the stable and stable-yard clean, and shall not permit, between the first day of June and the first day of November, more than two cart-loads of manure to accumulate in or near the same, at any one time.

SEC. 7. No person shall, himself, or by another, wash or clean any carriage or horse, on any street, sidewalk, or other public space, nor suffer the water used for such purposes to flow over any sidewalk, street or public space.

SEC. 19. Any violation of the provisions of this ordinance shall be punished by a fine not to exceed one hundred dollars, and the costs of prosecution; and in the imposition of any fine and costs, the Court may make a further sentence, that the offender be imprisoned in the Wayne County Jail or the Detroit House of Correction until the payment thereof: Provided, however, that the period of such imprisonment shall not exceed the term of six months.

N. B.—These provisions of previous ordinances are modified by section 18, of an ordinance of the City of Detroit, entitled "An Ordinance concerning the duties of the Board of Health of the City of Detroit, and providing for the maintenance of the public health," approved August 16th, 1881, which section reads as follows:

SEC. 18. The said Board and its Health Officer shall have authority to discharge all the duties relating to the health and sanitary condition of said city, now or heretofore discharged under any existing ordinance by any other officer of said city.

By order of the Board of Health.

——— ———, M. D.,
Health Officer.

In this connection it may be well, in order to complete the separate publication of all sanitary ordinances, to reproduce here

AN ORDINANCE

" to preserve the health and secure the safety of all persons employed in or connected with manufactories, workshops, salesrooms, warehouses, and other places of like character," approved September 7, 1881. The evident design of the ordinance, to afford needed protection to laboring people in a manufacturing city, is highly commendable; but in it a few matters pertaining properly to the Health Department are mingled with many matters that belong to some other authority in the municipal government. Such matters as properly come under the cognizance of the Board of Health are already provided for in other ordinances now in force. At the outset, I prepared and had printed a blank, containing all but sections 6 and 7 of this ordinance, but have found it impracticable to use it. The ordinance reads as follows:

It is hereby ordained by the People of the City of Detroit;

SECTION 1. No person, persons, company or corporation shall employ, put or keep at work in any room, building or enclosure in the City of Detroit, a greater number of persons than shall be warranted by the laws of health or approved by the Board of Health of said City.

Every manufactory, workshop, salesroom, warehouse and other place of like character, where two or more persons are employed, shall have suitable ventilating appliances sufficient for the carrying off of all foul or impure air, and for the reduction of the air therein to the standard of fresh air, and every such place shall have therein in each and every work room at least 500 cubic feet of air space for every person therein employed. Every such place shall be supplied with sufficient doors, stairways and fire escapes for the security and escape, in case of fire or accident, of all persons employed therein, and if any such building, enclosure or place shall be of two or more stories in height and sixty feet in depth or over, the same shall contain both front and rear stairways on each floor above the first, sufficient in size and arrangement for the accommodation of all persons needing the use thereof.

SEC. 2. All vats, pans and receptacles and vessels containing or used for handling molten metals, hot liquids or inflammable substances shall be protected and surrounded with suitable safe-guards for preventing fires or accidents or injuries to those employed at or near them.

SEC. 3. No owner, lessee, superintendent, foreman, agent or person in charge of any building or structure occupied as a manufactory, workshop, salesroom or for other purposes where many persons are employed, shall permit the same to be occupied or used unless the walls, floors and roofs thereof are in good and safe condition, and unless such building is duly supplied with the appliances, stairways and fire escapes above required.

SEC. 4 Every such building, structure, room, shop, or enclosure shall be kept in a clean and healthy condition, free from sewer stenches and offensive smells from drains, privies, stables or other places, and from obnoxious gases, vapors, dust or other impurities, generated by manufacturing processes or otherwise, and injurious to health, and in every case be provided with sufficient and properly ventilated privies and urinals for the separate use of male and female employés.

SEC. 5. The Fire Marshal, in cases of all buildings hereafter constructed in the city for the purposes above mentioned, shall make it a condition of the permit by him to be granted that all stairways and fire escapes shall be provided as above required.

SEC. 6. The Board of Health shall visit and inspect or cause to be visited and inspected by the Health Officer, all places in the city used or occupied for the purpose above mentioned at least once in every two months, to see that the requirements of this ordinance are complied with and for the purpose of making complaint for any violation thereof.

SEC. 7. The Board of Health shall annually on the first of July place full and detailed statistical reports of the work of the Inspectors before the Common Council. The reports shall specify the following:

1. Number of males and females of all ages employed, also number of boys and girls under fifteen years of age employed.

2. The number of violations of this ordinance and the number of abatements, with detailed accounts of improvements effected.

3. General and special sanitary condition of all people in labor or service in factories, workshops, stores, warehouses, elevators, yards and domestic work-rooms.

4. Number and kind of dangerous and unhealthy employments and diseases of the several trades and occupations. Such reports shall be printed as public documents for the information of the people.

SEC. 8. There shall be affixed at the entrance of each place of employment, when and where the Health Officer may direct, a copy of this ordinance, in large type on card paper, to be furnished by the city.

SEC. 9. Any corporation, manufacturer, employer, agent or other person refusing admission to his or her factory, workshop, store or other place of employment or service, to the Board of Health or Health Officer, or refusing or neglecting to comply with the provisions of this ordinance, shall be fined not exceeding $200, and in the imposition thereof the court may further sentence that, in default of the payment of the fine imposed, the offender be imprisoned in the Detroit House of Correction for any period of time not exceeding six months.

SEC. 10. This ordinance shall take immediate effect.

Approved September 7, 1881.

Section 4 contains provisions that legitimately pertain to the Board of Health, but other ordinances, enforced by this department, reach the same evils. Sections 6 and 7 are illegal and void, for two reasons: (*a*) They require the Board of Health and the Health Officer to do things that are not within their jurisdiction, and cannot be placed within their jurisdiction except by a special act of the sovereign Legislature of the State; (*b*) they require an amount of work impossible to perform, even were all other sanitary work neglected. They are, therefore, both legally and practically unreasonable, and no court could, or would, enforce them.

This completes a full publication of existing sanitary ordinances, in a form convenient for reference, and an exhaustive explanation of the methods pursued by the Health Department in its daily work. Already about four hundred cases of important nuisances are recorded in this office.

RECOMMENDATIONS AND SUBJECTS MORE BRIEFLY DISCUSSED.

> "*Pure air is a necessity for health; but an individual may have little control over the air which surrounds him, and which he must draw into his lungs. He may be powerless to prevent other persons from contaminating his air, and thereby striking at the very foundation of his health and happiness. Here, as in so many cases which demand the regulation of the conduct of individuals towards each other, the State steps in for the protection of its citizens, and enacts rules which shall be binding upon all. Hence arises what is now termed 'State Medicine,' a matter of the greatest importance. The fact of State Medicine being possible, marks an epoch in which some sanitary rules receive a general consent, and indicates an advancing civilization. Fear has been expressed lest State Medicine should press too much on the individual, and should too much lessen the freedom of personal action. This, however, is not likely, as long as the State acts cautiously, and on well-assured scientific grounds, and as long as an unshackled Press discusses with freedom every step.*—
> DR. PARKES.

I.—ICE SUPPLY OF DETROIT.

The old notion that all ice is pure, no matter what may be the character of the water on which it is frozen, is a delusion and a snare. Epidemics of typhoid fever have been traced to impure ice. As in our climate, during the hot months of summer, it requires about the same weight of ice as water to make the latter palatable to drink, it is necessary to exercise equal care about the purity of both. It not unfrequently happens that an outcry is made about the impurity of drinking water, when in reality the fault is in the ice mixed with it. Ice is supplied to families in Detroit, cut in-shore on the river, below the discharge of great sewers, inside of docks, where no mortal would think of drinking the water. Ponds in the suburbs, the water of which is repulsive even to look at, furnish crystal ice, which people, otherwise prudent and careful, put in their coolers, and use in contact with fish, poultry, fruit, and other delicate food. The essential poisons of sewage are mingled with lemonade and other cooling drinks, by means of the ice used abundantly in their preparation. The spores of mycroscopic plants, of deleterious cryptogams, living in putrescent stagnant water, may be "imprisoned in thick ribbed ice" and conveyed to the stomach in a draught that refreshes on a hot summer day.

At Rye Beach, in New Hampshire, an attractive summer resort, there was mysterious sickness in one of the large hotels, in the summer of 1875. "A disturbance of the digestive system, characterized by a sensation of giddiness and nausea, vomiting, diarrhœa, severe abdominal pains, all of which was accompanied by fever, loss of appetite, continued indigestion, and mental depression," was a professional description of the sickness prevalent in that particular hotel. At length it was discovered that the "crystal" ice used was cut from a stagnant pond in the vicinity, the water of which smelled very bad in summer. There was no bad smell in the ice. It was clear in color, and only chemical examination compelled belief in its impurity. The result of the analysis, expressed as usual in 100,000 parts, was as follows:

Ammonia	0.0208
Albuminoid ammonia	0.0704
Inorganic matter	7.80
Organic and volatile matter	5.72
Total solids at 212° Fahr	13.52
Chlorine (when filtered)	3.23

A specimen of pure ice, analyzed at the same time, gave 0.76 of total solids and 0.02 of chlorine.

Of course the ice was not as bad as the water from which it was cut, yet it was bad enough to sicken and endanger many people in the midst of otherwise healthful circumstances.[1]

A young chemist of this State, C. P. Pengra, read a brief but very important and interesting paper on the subject of

PURIFICATION OF WATER BY FREEZING,

before the recent Sanitary Convention at Ann Arbor, which I gladly here reproduce, as follows:

"The purification of water by freezing is a question of considerable importance, and although intimately connected with hygienic work, seems to have been quite overlooked in the past. It is admitted that there is no *absolutely pure* water in *nature;* the nearest approaches being distilled, rain, snow and ice-water: and as regards impurities of either—and one's opinions must naturally be formed from a knowledge of the source—the immediate conclusion would seem to be that ice-water passes through the most favorable condition for contamination, and it would also seem that from this consideration alone more good would come in the way of greater discrimination in its harvest; but people have lived and the same people have used impure ice, and with this experience of the ages as a guide, the public stamp of "custom" has been sufficient to prolong and increase the practice. The general opinion being that the process of freezing is a ready and sufficient means of purification, the result of which has been to use *ice-water* from any and every source, and for all purposes.

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[1] For a fuller account of impurities in ice, see a paper by A. H. Nichols, M. D., in the Seventh Report of the Massachusetts State Board of Health, 1876, p. 465. His conclusions were verified by Prof. S. P. Sharples, Prof. E. S. Wood, and Prof. W. B. Hills in 1879. See the tenth Massachusetts State Board of Health Report, 1879, pp. 119, 120.

The few exceptions to this general opinion are to be found among scientific men, and so careless have been their observations, and especially their reports, that the public are scarcely warranted in admitting their reliability. For example, Pavy, in his study of "Foods," says that purification of water by freezing is imperfect, because common salt can often be *tasted* in ice, and even Hassall, from whom only I have been able to obtain any results of analyses, states that ice-water is one of the purest in nature: owing to a very beautiful and remarkable fact, that, in freezing, which is an act of crystallization, *all* or *nearly all* substances or impurities, gaseous, organic and mineral, are cast out and may be found in the unfrozen liquid; that a well-known illustration of this fact is afforded by icebergs, which although formed from the sea, yet when melted, consist of water in a state of *great* purity.

Remarks like these, supported by but *one* set of experiments, are evidence of the source of the general opinion of which I have spoken.

No one will contend that all ice is equally, any more than that it is absolutely, pure, but will in all probability admit that our aim should be to appropriate that which is the most pure and wholesome. With this end in view, at the instigation of Dr. Vaughan, we have been induced to make a series of experiments, by no means at an end, but the results of which to date have been as follows: Our first experiments were with solutions of crystalloids, and first of these with urea, dissolved in distilled water, and afterwards estimated by Liebig's method:

100 cubic centimeters of which before freezing contained .83 grams.
100 cubic centimeters of which from the ice....contained .50 grams.
100 cubic centimeters of which not frozen......contained 1.30 grams.

In other words a "casting-out" of .33 grams (40 per cent.) by freezing.

The second experiment with urea, as found in normal urine and estimated by nitrogen:

7300 cubic centimeters before freezing.........contained .91 per cent.
165 cubic centimeters from the ice...........contained .42 per cent.
Showing a purification of 53 per cent. by freezing.

A third experiment with grape sugar, in which

100 cubic centimeters of the original solution...contained 1.5 grams.
100 cubic centimeters from the ice.............contained .96 grams.
A purification of 55 per cent. by freezing.

In the fourth experiment, As_2O_3 was dissolved in NH_4OH and diluted to 1000 cubic centimeters with water, as analyzed by Mr. T. H. Hubbard, of the Pharmacy Department:

1000 cubic centimeters of original solution.....contained 1.78 grams.
500 cubic centimeters from ice...............contained .48 grams.
500 cubic centimeters not frozen.............contained 1.30 grams.

A 40 per cent. purification by freezing. I may also add just here, the one experiment of Hassall, in which the mixture was frozen artificially and where the total solids of original water were 27 grams, of ice 3 grams, water not frozen, 14.2 grams.

ORIGINAL WATER.	ICE.	WATER NOT FROZEN.
Chlorine, 1.94 grams.	.9 grams.	None.
Calcium, 10.50 grams.	Trace.	14.5 grams.

The deduction from which would tend to show *more* purification than in the former cases, but that the experiment was only an approximation, is evident when we consider that there were four grams more Ca. found in the water not frozen than in the original solution.

Our next experimentation was with colloids, and we regret that it has been confined to albumen, but since our results have been quite constant, the three will be better evidence of the one fact. In the first, about 1000 cubic centimeters of a solution of egg albumen were frozen solid:

50 cubic centimeters of the lower third	contained 6.87 grams.
50 cubic centimeters of the middle third	contained 4.19 grams.
50 cubic centimeters of the upper third	contained 3.015 grams.

Showing a gradual but slight purification from above downwards.

In our second experiment with albumen, as found in albuminuria:

50 cubic centimeters from ice	contained .5 grams.
50 cubic centimeters from unfrozen urine	contained .8 grams.

A purification of about 20 per cent.

In a third, with egg albumen:

50 cubic centimeters of the original solution	contained .25 grams.
50 cubic centimeters from ice	contained .21 grams.
50 cubic centimeters from unfrozen solution	contained .35 grams.

A purification again of about 20 per cent.

As will be noticed, the purification of crystalloids is at least thirty per cent. less than that of colloids. It is obvious that these results must vary with the rapidity of freezing, but as these specimens were frozen naturally, and under the varying temperatures to which common ice is subjected, they may be considered even more applicable to the general purpose of sanitary work. The conclusions drawn from the foregoing were quite beyond our expectations, not supposing that there would be so great purification as has been evident, but while this information has been somewhat of a surprise, it is also sufficient proof that we cannot, as sanitarians, admit the indiscriminate collection of ice, as is too often practiced, but should lead us to endeavor to persuade the public that pure ice can only come from pure water. The ice from water of cesspools or privies, cellars, cemeteries and the like, or containing any dead and decaying animal or vegetable matter, or from muddy streams, stagnant or shallow ponds or pools, *cannot be pure* or even wholesome, and the practice of gathering ice from such is absolutely injurious to health; even if used for no other purpose than that so common of packing poultry and various other fresh meats.

In other experiments, which we hope to complete in the near future, we shall attempt to estimate the purification, if any, as affecting the numerous organisms, so common in water.

Since writing the above, I have read a paper as presented by Dr. Orlando Brown, and printed in the Second Annual Report of Connecticut State Board of Health, recording instances in which it was demonstrated beyond doubt that very serious disease resulted from using impure ice; he regards albuminoid-ammonia as a reliable indication of contamination when excessive, and when accompanied with but little free ammonia and no evidence of chlorine, its presence indicates vegetable decay, the products of which contaminate water, whereas the presence of chlorides indicate contamination from animal decay.

The report as a whole is but additional evidence of the necessity of extra precautions in sanitary work.

A PUBLIC NEED.

It is not necessary to multiply proofs. It is very evident that the ice supply of Detroit needs sanitary supervision. The one essential rule is that ice should not be gathered for household use, for use anywhere in connection with foods and drinks, from water that would not be used for the same purpose. "Safety demands," says Prof. Wm. R. Nichols, a very high authority, "that it should not be cut for domestic use on ponds or streams which are so polluted as to be rejected for water-supply."—*Ziemssen's Cyclopœdia of Medicine, Vol. XVIII, p.* 292.

A proper ordinance on the subject should be passed early enough to enable the Board of Health to regulate the cutting of ice next winter, and the supply to our homes next summer. The sections of the Charter already quoted in a previous part of this report, confer ample power on the Common Council for such a needful purpose.

II.—MILK SUPPLY OF DETROIT.

It is not my object, in introducing the subject of milk supply here, to discuss it in detail; my only purpose is to suggest ways and means and to recommend measures to bring the traffic under the proper and needed supervision of the health authority. Municipal governments have found no matter, of such general importance to the community, so difficult to regulate with just and wholesome enactments. The apathy of the people in matters vital to their own welfare is a feeble barrier to the energetic and aggressive efforts of a few men moved by strong self-interest. One or two hundred milkmen, with their employés, are more formidable to ambitions in a city election, than an insignificant handful of citizens who have a sufficiently active sense of indignation over a public evil to make them abandon political issues for the general good. Experienced municipal politicians understand the significance of local questions, raised by individuals interested in preserving an imposition upon the people sanctioned by immemorial custom. One man who profits by an abuse is mote potent than a hundred men who regard it with indifference.

The daily amount of milk sold to citizens of Detroit is not less than 20,000 quarts. At 6 cents a quart, the minimum price, the amount is $1,200 each day, or $438,000 per annum.

If the milk sold is vitiated in quality by removal of cream, by keeping back the "strippings," or by watering, to the extent of only 10 per cent., the total yearly loss to citizens is more than $40,000. If any considerable part of the milk sold is rendered unwholesome by filthy stables, improper feed, unclean surroundings, diseased cows, etc., none but Heaven can measure the sickness and suffering, or record the deaths, thereby caused among the households of the city. Against such considerations, no fictitious "personal liberty" to be nasty, no spurious "freedom of trade" to supply the people with adulterated and polluted food can stand for a moment.

There are other worse things than "sugar meal," brewers' "grains," etc., entering into the grave question of milk supply. As Dr. George Wilson, a high sanitary authority, says: "The greatest danger attaching to milk, as a carrier of disease, depends upon its remarkable powers of absorption and the rapid fermentive or zymotic changes it undergoes when it becomes mixed with putrifying matter or tainted with diseased germs." The very essence of dung saturating the air of stinking stables, the poisonous vapors of organic decay, the floating contagion of scarlet fever, diphtheria and other infectious diseases are all rapidly absorbed by milk, as a sponge takes up water, and may be conveyed to the mouths of innocent children and unsuspecting adults. When cows become unhealthy by being confined for several months in close, dark, unventilated stables, their milk undergoes vital changes, which chemistry cannot detect, which the microscope does not reveal, which the senses fail to discover, making it unwholesome. No person should be allowed by public authority to sell to the people an article of food so delicate as milk, so liable to contamination, of such universal use, except under conditions that shall reasonably guarantee its cleanliness and freedom from every form of poison. Every milk-producer for this market should be required to turn his cows out to pasture during several months of the year; to underdrain his stables, so as to secure them against collections of putrifying liquid manure; to make the floors of his stables tight, so as not to saturate by poison the earth beneath them with foul excreta; to clean his stables frequently and thoroughly, so as to keep the atmosphere within them reasonably sweet; to frequently remove the dung from the premises; to give his cows plenty of space, light and air, so as to keep them healthy;

to turn them out into the open yard or field every fair day, so as to protect them from the unwholesome influence of long and close confinement; to use no garbage or fermenting feed; to keep his utensils clean; to use only pure water for his stock and cleansing cans, pails, etc., and never to subject his cows to the vile company of swine.

During the past winter a few of the filthier milkmen were required to clean up their premises or quit the business. Recently, several respectable dealers have been to the Health Office and requested to have the trade regulated by license, founded on conditions of cleanliness, sound feed, and pure supply. They are on the right track. The public health and safety, and the true interest of dealers lie in the same direction. License should not be imposed for the sake of revenue. It should be proportioned to the number of cows, so as to be hightest on the smallest dairymen. The revenue from licenses might be enough to pay for the services of an Inspector, so as not to increase municipal expenditure.

The municipal legislature has not been clothed with the chartered authority to pass an ordinance to restrict the sale of milk by license, or to give an Inspector jurisdiction beyond the city limits, as the following communications from the City Attorney and the City Counselor clearly indicate:

City Attorney's Office,
Detroit, March 11th, 1882.

Hon. O. W. Wight, and Board of Health:

Gentlemen,—In compliance with your request of the 10th inst., for my opinion relative to the powers of the Common Council to regulate by ordinance the sale of milk in the city, I have given the matter consideration and find that the Charter empowers the Common Council with authority to "prohibit, prevent and suppress the sale of every kind of unsound and unwholesome *food* and provisions,"—Sec. 177, p. 118.—and "provide for the preservation of the general health of the inhabitants,"—Sec. 171, p. 113.

We have an ordinance under this section which prohibits any person "selling or offering for sale any unsound, or unwholesome article of food." Milk is certainly an article of food, and if unwholesome, any person offering it for sale may be prosecuted. The Council may pass an ordinance with some further restrictions than the present ordinance provides, but it would have no power to say how the stables shall be cleaned, or the cows cared for; if the stables were allowed to become very filthy, complaint might be made to abate it as a nuisance.

The only way to regulate this article of food is by an examination of the milk *itself.*

Very respectfully,
JNO. B. CORLISS.

City Counselor's Office,
Detroit, March 14th, 1882.

Dear Sir,—In reply to yours of 10th inst., I am compelled to say that, by diligent search even "as with a lighted candle," I am unable to find any Charter authority for such an ordinance as you desire the Council to adopt.

Yours truly,
HENRY M. DUFFIELD,
City Counselor.

To O. W. Wight, M. D.,
Health Officer, City.

It will therefore be necessary to seek an amendment to the Charter, giving to the Common Council power to make such regulations in regard to the milk supply of the city as shall secure the citizens from fraud and unwholesome adulteration. When the requisite legislation can be obtained, I earnestly recommend for consideration some such ordinance as the following:

AN ORDINANCE

to prevent the sale of impure, adulterated or infected milk in the City of Detroit.

It is hereby ordained by the People of the City of Detroit:

Section 1. For the purposes of this ordinance, the term "milk-man" shall mean any person who produces milk and sells it to others; the term "milk-dealer," shall mean any person who purchases milk and sells it to others; the term "milk-agent," shall mean any person who sells milk on account of a "milkman" or a "milk-dealer."

SEC. 2. Every milkman or milk-dealer, who sells milk in the City of Detroit, shall procure a license therefor from the Mayor of said city, on or before the first day of November of each year, which license shall be good for one year from the date thereof, unless the same shall be revoked for cause, as hereinafter provided.

SEC. 3. The Mayor shall grant such license only on the written recommendation of the Board of Health, and on the payment by the recipient of the license of a sum of money equal to fifty cents each for the whole number of cows from which the milk is to be sold under such license.

SEC. 4. The Board of Health shall give such written recommendation only upon the following conditions, to-wit: (1) All the cows from which the milk is to be sold under the license applied for shall be turned out to pasture not less than five months of each year; (2) the ground on which any stable stands in which such cows are kept shall be thoroughly under-drained; (3) the floor of such stable shall be constructed of hydraulic cement, or sound, tightly-laid plank, so that no water nor liquid manure can penetrate through the same to the ground, and no swine shall be kept therein; (4) all liquid manure shall be conducted from such stable by an underground drain-pipe to a safe receptacle for the same; (5) such stable shall be well ventilated and well lighted, and shall be large enough to give each cow kept therein not less than six hundred cubic feet of air-space; (6) such stable shall be thoroughly cleaned often enough to keep the same free from any putrefactive smell, and all manure, both solid and liquid, shall be removed from the surrounding premises every day; (7) the cows from which milk is to be sold under the license shall be turned out into the open air from two to six hours every day, except in severe storms, at all seasons of the year, and shall be supplied with an abundance of pure water;

(8) cows from which milk is to be sold as aforesaid, shall not be fed with garbage or any fermented feed; (9) and such applicant for license as aforesaid, shall have the necessary conveniences, and give evidence of possessing the inclination, to comply with the requirements of Act No. 26, Laws of Michigan, 1873, which said act is hereby made part of this ordinance.[1] The Board of Health shall ascertain these pre-requisites to giving a written recommendation for a license, by personal inspection, or from reports in writing, and placed on file, by a skilled Inspector appointed by the Board. And no person refusing to submit to inspection by the Board of Health or their authorized agent shall receive a license

SEC. 5. Each license granted as aforesaid shall contain the name in full and the address of the person to whom it is granted; shall state the number of cows from which milk is to be sold under such license, and where the same are kept; and shall be numbered. Corresponding entries shall be made upon a stub-book to be preserved in the office of the Mayor.

SEC. 6. The name and license number of each milkman or milk-dealer shall be painted conspicuously, in plain letters not less than three inches long, upon every wagon, cart, sleigh or other vehicle employed by him or his agent in distributing milk to customers, and upon any grocery, or other place of business where he or his agent sells milk or offers milk for sale. Any person refusing or neglecting to comply with the requirements of this section shall, on conviction thereof, pay a fine of not less than five nor more than twenty-five dollars for each offense.

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[1] SECTION 1. *The People of the State of Michigan enact:* That whoever shall knowingly sell to any person or persons, or sell, deliver or bring to be manufactured to any cheese or butter manufactory in this State, any milk diluted with water, or in any way adulterated, or milk from which any cream has been taken, or milk commonly known as "skimmed milk," or shall keep back any part of the milk known as "strippings," with intent to defraud, or shall knowingly sell milk, the product of a sick or diseased animal or animals, or any milk produced from any cow fed upon the refuse of a distillery, or of a brewery, or upon any substance deleterious to the quality of the milk, or shall knowingly use any poisonous or any deleterious material in the manufacture of any cheese or butter, or shall knowingly sell or offer to sell any cheese or butter, in the manufacture of which any poisonous or deleterious substance has been used, shall be deemed guilty of a misdemeanor, and on conviction thereof shall be fined not less than ten dollars, nor more than one hundred dollars; and may be committed to the County Jail until such fine shall be paid: Provided, that such imprisonment shall not exceed ninety days, and shall be liable in double the amount of damages to the person or persons, firm, association, or corporation upon which such fraud shall have been committed.

SEC. 7. The Mayor shall revoke any license granted as aforesaid, whenever the President of the Board of Health, or the Health Officer, shall make affidavit to him that the recipient of the same is not complying with the conditions upon which the same was granted, or has been convicted by the Recorder's Court of having violated any section of this ordinance.

SEC. 8. Any person except an employé or agent of a licensed milkman or milk-dealer, selling milk in the City of Detroit without first having procured a license therefor according to the provisions of this ordinance, or whose license has been revoked, shall, on conviction thereof, pay a fine of not less than twenty-five nor more than one hundred dollars for each offense.

SEC. 9. Any person who shall sell, offer for sale or cause to be sold, or give away or offer to give away, or bring or cause to be brought into the City of Detroit any milk that has been drawn or handled by anyone laboring under a contagious or infectious disease, or by anyone whose clothing or person is infected with such disease, or milk which has stood in a room occupied by one laboring under such a disease, or in a room that has not been properly disinfected after being thus occupied; or milk which has been stored in cans, pails or other utensils that have been washed or otherwise handled by such a diseased person; or milk which has in any way been subject to the contamination of human excreta or the decomposing excreta of animals; or milk from a sick or diseased cow; or milk adulterated with any foreign substance, shall, upon conviction thereof, be subject to pay a fine of not less than fifty nor more than one hundred dollars, or to imprisonment in the Detroit House of Correction not less than thirty nor more than ninety days, or both.

SEC. 10. Every employé or agent of any milkman or milk-dealer, engaged in the sale or distribution of milk, shall carry a card, on which shall be clearly written the name and address of such employé or agent, also the name and license number of his employer or principal, and such employé or agent shall exhibit the card aforesaid, on demand, to any Policeman or officer of the Board of Health. Any person violating this section shall be subject to a fine of not more than ten dollars.

SEC. 11. It shall be the duty of every Police officer to arrest the driver of any wagon, cart, sleigh or other vehicle used for the distribution of milk, on which shall not be painted the name and license number of the milkman or milk-dealer using the same, also any grocer or other tradesman selling milk, on whose place of business the name and license number of the milkman or milk-dealer for whom or on whose account he sells the same shall not be painted, as provided in section six of this ordinance, and the person thus arrested shall, upon conviction thereof, pay a fine of not less than one dollar nor more than five dollars, and unless the person thus arrested can show to the satisfaction of the court that he is the *bona fide* employé or agent of a licensed milkman or milk-dealer, he shall be subject to the penalty imposed by this ordinance for selling milk without a license.

SEC. 12. Every milkman or milk-dealer, or the employé or agent of such milkman or milk-dealer, shall sell to any officer or employé of the Board of Health one quart or less of milk, on tender therefor of the customary price, for analysis, and every refusal thus to sell shall be punishable by a fine of not more than ten dollars.

SEC. 13. It shall be the duty of the Board of Health to appoint, subject to the confirmation of the City Council, a competent milk Inspector, to hold office during the pleasure of said Board, for the purpose of carrying out the provisions of this ordinance, whose salary shall not exceed the amount paid for milk licenses.

SEC. 14. All ordinances and parts of ordinances, not consistent with the provisions of this ordinance, are hereby repealed.

SEC. 15. This ordinance shall take effect and be in force on and after its passage and approval.

Owners of buildings and steam boilers are required by ordinance to defray the expense of inspection. There is no reason why the inspection of dairies and supervision of the milk supply should not be equally self-sustaining. A license of five dollars for a dairy of ten cows, fifty cents per head, is very small compared with the license for selling beverages. Such a tax would not be oppressive, and the largest and best milkmen and dealers would acquiesce in it without complaint.

It is essential that supervision of the milk business should include frequent inspection of the cows and the stables where they are kept. Unhealthy animals give unhealthy milk. Foul, unventilated stables and unwholesome feed make the animals unhealthy. Parents could often find the source of sickness in the households by visiting the place where their milk is produced.

III.—THE SMOKE NUISANCE.

Not long ago a leading Detroit newspaper published the following timely editorial:

"It is now three years since an Inspector of Smoke was appointed in Cincinnati, in hopes of abating the terrible nuisance from which large manufacturing cities, using soft coal, suffer so much. There were many practical difficulties in the way of enforcing the ordinance, chiefly because the experiments with smoke consumers were yet crude, and it was impossible to recommend any machines, or insist upon their use. When the Inspector was appointed, only five persons in the city had complied with the ordinance, and, although many expressed their willingness to do so, they were not willing to adopt consumers without any knowledge or experience in the matter. But this obstacle has been gradually removed, and there are now a sufficient number of efficient and economic smoke-consumers to enable all persons to make a proper selection, leaving no excuse for failure to comply. Of 170 persons using steam boilers in the district already established, seventy-eight have complied with the ordinance, and the others have been notified to do so within thirty days. The experience of *The Free Press* with a smoke consumer is emphatically in favor of the practicability of smoke-consuming devices. It has been in use over three months and has completely abated the nuisance. The question is no longer debatable. Smoke can be consumed without an additional cost, and with, perhaps, a sufficient saving of fuel to pay for the consumer. Under these circumstances every boiler in the city, at any rate in that part of the city where they are most numerous, should have a smoke-consuming apparatus attached. It ought to be done, too, before the outpouring soot shall have begrimed the buildings and given the city a sombre and uncleanly aspect. It is the duty of the city government to introduce, pass and enforce a regulation or ordinance requiring owners of boilers, within certain defined limits, and where soft coal is used, to affix efficient smoke-consumers and abate the nuisance their chimneys create."

The argument of this article is unanswerable, and the conclusion that an ordinance is now needed in Detroit to compel the consumption of smoke is fully endorsed by the Health Department of the city government. The Health Officer has procured from Cincinnati a copy of their ordinance and made it the basis, with such alterations as local circumstances seem to require, of a proposed measure for relieving the city of a nuisance not only injurious to health but also largely destructive of property. The mortality tables at the end of this report show that pulmonary diseases lead all others in the death-rate. No one needs to be told that soot and smoke in the air add seriously to the irritation of diseased and weakened lungs. Housekeepers know to their sorrow how furniture and clothing are injured in the vicinity of a smoking factory. There are regions in the city where it is impossible to hang out a "wash" to dry, on account of great volumes of smoke and showers of soot. It may be a matter of economy to burn coal dust, the refuse of mining and storing coal, but the property-rights and comfort of the neighborhood must be consulted. As the future prosperity of Detroit depends in great measure upon manufacturing, it is not worth while to check it by any unnecessarily restrictive measure; but as the article, quoted above, clearly shows, it is economy to utilize fuel by wholly burning it, instead of sending it into the air as unconsumed carbon, to begrime everything upon which it falls.

AN ORDINANCE

to provide for the abatement of the smoke nuisance in the City of Detroit.

It is hereby ordained by the people of the City of Detroit:

SECTION 1. That every furnace employed, or to be employed, in the City of Detroit in the working of engines by steam, and every furnace employed, or to be employed, in any mill, factory, printing-house, dye-house, iron-foundry, gas-house, distillery, brew or malt-house, bakery, gas-works, water-works, or other buildings used for the purpose of trade or manufacture within the limits of said city (although a steam engine be not used or employed therein), shall in all cases be constructed or altered so as to consume or burn the smoke arising from such furnace, and if any person shall hereafter, within said city limits, use any such furnace which shall not be constructed so as to consume or burn its own smoke, or shall so negligently use any such furnace as that the smoke arising therefrom shall not be effectually consumed or burnt, or shall carry on any trade or business which shall occasion any thing obnoxious or offensive, or otherwise annoy the neighborhood or inhabitants, without using the best practicable means for preventing or counteracting such annoyance, every person so offending, being the owner or occupier of the premises, or being a foreman or other person employed by such owners or occupier, shall upon conviction for such offense, before the Recorder's Court, forfeit and pay a sum not less than twenty dollars nor more than fifty dollars; and upon a second conviction for such offense, the sum of fifty dollars, and for all subsequent oonvictions for such offense, the sum of one hundred dollars. The word "person" herein shall be construed to embrace corporations as well as natural persons or partnership associations: Provided always, that the words "consume or burn the smoke" shall not be held in all cases to mean "consume or burn all the smoke;" but that the Judge of the Recorder's Court shall not impose the penalties enacted by this ordinance if he shall be of the opinion that the accused has, so far as practicable, so constructed or altered his furnace as to consume or burn, as far as possible, the smoke arising from such furnace, and has carefully attended to the same with a view to prevent the escape of smoke therefrom.

SEC. 2. The provisions of section 1 of this ordinance shall apply to all railway locomotives while within the corporate limits of the City of Detroit, and to all steamboats while lying at the docks of said city.

SEC. 3. As soon as reasonably may be, after this ordinance goes into effect, there shall be appointed by the Mayor, subject to confirmation by both Councils, a fit person to be an Inspector of Smoke in said city. And it shall be lawful for the said Inspector, and he is hereby required to commence and aid in prosecuting informations or legal proceedings against any person for the recovery of any penalty or forfeiture to be incurred under or by virtue of the enactment herein contained with respect to the prevention of smoke, and it shall also be lawful for any inhabitant of the city to commence and prosecute, at his own cost and risk, any such information or proceeding: Provided, that in the event of such information or proceeding being dismissed for want of prosecution by the informant, or for the insufficiency of evidence, the dismissal shall be at the cost of the informant.

SEC. 4. The salary of said Inspector shall be one thousand five hundred dollars per annum, and before entering upon the duties of his office he shall give a good and sufficient bond in the sum of ten thousand dollars, to be approved by the City Attorney and Controller, for the faithful performance of his duties.

SEC. 5. Said Inspector shall be subject to the direction of the Board of Health of said city.

SEC. 6. This ordinance shall take effect on and after sixty days from its final passage.

The proposed ordinance, while based on the one that is found to work well in Cincinnati, is more comprehensive and more economic. The salary there provided for the Inspector of Smoke is $2,500. It would be well for the municipal legislature to consider whether the duties of an Inspector of Smoke might not be added to the duties of the Boiler Inspector, or the Inspectors of Buildings, with still greater economy in the public service.

IV.—THE GLUCOSE FACTORY.

My first official act as Health Officer of Detroit was to inspect, in company with the Board of Health, the manufacturing establishment of the Michigan Grape Sugar Company, located on West Fort street, in this city, and commonly known as the Glucose Factory. The newspapers were full of complaints about the nuisance there created, and citizens had already commenced suit, employing able counsel, in the Superior Court, seeking relief from the unpleasant stenches emanating from the establishment. It was like all factories of the kind, in the management of which no extraordinary pains are taken to conduct the well-known process of making glucose from corn without causing annoyance to the neighborhood. The smells arising therefrom are pungent and penetrate to considerable distance. The manufacture of glucose can easily be classed with the "offensive trades."

As the matter was already in the hands of the Superior Court, and as the managers expressed themselves willing to do anything in their power to abate the nuisance, the Board of Health determined to await the results of legal proceedings commenced, and to give such advice as might obviate the necessity of suppressing the works entirely, if the advice should in good faith be followed. The Health Officer addressed himself earnestly to a study of the processes of manufacturing glucose, and endeavored to invent appliances that should obviate the evils complained of, which were only too obvious to the senses of people living in the nighborhood. The results of the investigation were given to the Company in the following communication:

DETROIT, Oct. 18, 1881.

J. D. HAYES, ESQ.,
President Michigan Grape Sugar Co.:

DEAR SIR,—The Board of Health have directed me to make to you any suggestions within my knowledge to aid you in your efforts to abate a public nuisance of unpleasant odors arising from your manufacturing establishment. The task before you is not without difficulties, and its accomplishment will involve the expenditure of considerable money. The superintendent of your works, Mr. J. J. Tonkin, has clear and full knowledge of the sources of nuisance in the process of manufacturing glucose from corn, and I would respectfully recommend you to follow his directions.

Butyric acid and lactic acid—the former is especially offensive—are generated in gaseous form by the action of caustic soda on the liquid mixture of impure starch in 24 large tubs, holding 10,000 gallons each (nearly a quarter of a million gallons altogether), in the lower story of your main factory. These organic vapors are diffused in the surrounding atmosphere and cause a very disagreeable smell. This part of the general nuisance may be remedied by enclosing the 24 tubs aforesaid with an air-tight bratice (this is a mining term which your Mr. Tonkin understands), from which the gases may be easily forced through an air-tight cylinder, or box, by means of a " fan " to the fires under the boilers, there to be consumed. Foul air from the "dead" corners about the tubs would go the same way.

At another point of the process, in an upper story of the building, where the sulphuric acid and nitric acid with which the purified starch is converted into glucose, are neutralized by the action of lime, the same organic gases are generated, and should be conducted, as from the tanks below, to the furnace fires.

The animal charcoal used in the process as a decolorizer and deodorizer, becomes rapidly impregnated with various odorous matters which it gives off in gaseous form when re-calcined, as it has to be every day. Instead of delivering these stinking vapors into the atmosphere to annoy the neighborhood they should be conducted to the brisk furnace fire under the calcining chamber, there to be subjected to the great purifier.

The waste product after grinding the soaked corn, consisting of the hulls of the grain mixed with glueten, undergoes putrefactive fermentation very quickly in warm weather and should be either immediately removed in tight covered tubs, or, a better way, be at once dessicated in a drying room, when it may be kept any length of time without becoming offensive. Only the air of this drying room will be loaded with bad-smelling organic vapors, which should be conducted to the furnace fires.

You have an abundance of water on the premises, which should be copiously used to keep every floor in the building constantly clean.

Finally, as the refuse water from your factory, as from all such establishments, becomes very rapidly fetid, "from the the presence," says Prof. Ambroise Tardieu, "of large quantities of vegetable and animal organisms acting like ferments and liberating sulphuretted hydrogen from the sulphates in the water," you should have a sewer of your own, constructed of well-laid and tightly-jointed vitrified pipe, 18 inches in diameter, running directly from the factory to the river, and not use the public sewer at all.

All these measures for the prevention of nuisance will cost, at a rough estimate, not less than $5,000. The expense will be considerable, but as a learned jurist says, "The public health, the welfare and safety of the community are matters of paramount importance, to which all the pursuits, occupations and employments of individuals, inconsistent with their preservation, must yield."—(Commonwealth vs. Upton, 6 Gray, 473.) An old but excellent authority on the Common Law says: "It hath been holden that it is no common nuisance to make candles in a town, because the needfulness of them shall dispense with the noisomeness of the smell. But the reasonableness of this opinion seems justly to be questionable, because, whatever necessity there may be that candles be made, it cannot be pretended to be necessary to make them in a town."—(1 Hawkins, P. C. Curren ed., p. 694, sec. 10.) It certainly cannot be pretended that glucose is more necessary in our time than candles were in the days of Hawkins.

Respectfully yours,
O. W. WIGHT, M. D.,
Health Officer.

The day previous, to-wit, the 17th of October, the Superior Court had granted to citizens who had filed their bill, "to restrain the Michigan Grape Sugar Co. as a nuisance by reason of noisome smells," an injunction, *pendente lite*, to take effect November 15: this time being given to enable agents to adopt preventive measures. There was delay in carrying out the recommendations of the Health Department, owing to the severe illness of Mr. Tonkin, the Superintendent of the works, who alone among the employés of the Co. had the experience and the skill necessary to direct the construction of the new appliances. December 22, the manager of the company was fined by the Superior Court $150 for breach of the injunction. Preventive measures were thereby hastened and, with one important exception, soon completed. The separate sewer recommended by the Health Officer was not constructed, owing to the fact, it was claimed, that the M. C. R. R. Co., whose track lies between the glucose factory and the river, refused right of way.

I have visited the establishment several times since the beginning of the year. During the winter there was no serious complaint made to the Health Office of its condition. Since the warm weather has commenced, complaints have sprung up again. The appliances recommended and adopted have worked well, so far as used, showing what can be done by taking the necessary pains. Occasionally, the workmen get careless and neglect to properly operate the fans and burn the noisome vapors. Refuse of soft coal does not make the best fire for burning organic vapors. The sulphuretted hydrogen liberated in the public sewers from the drainage of the place still makes nuisance, which will continue till the private sewer is constructed as recommended at first. Sometimes the "sugar meal," carted from the premises in a fermenting state to "dairies" in the country, emits a very disagreeable odor.

I am often asked whether sugar meal is good feed for cows. *The Utica Herald*, a journal published in the midst of a dairying country, not long ago published the following:

"On general principles most dairymen, if unbiased by the desire for gain, would at once pronounce that an article which becomes so sour in a few days after leaving the factory as to taint the air and be smellable twenty or thirty rods away, must be an improper food for milch cows, and must affect their milk unfavorably. It is universally acknowledged that whey should not be fed to cows, on account of the effect it has upon milk, and the same principle is even more imperative in the case of glucose meal. In the use of milk for the household, although no odor can be detected when cows have been fed upon the meal, the moment the milk is poured into coffee it assumes a stringy appearance and becomes an object of suspicion.

"We hear of one milkman who commenced using the meal without the knowledge of any of his customers. They at once began to complain, and threatened to leave him if there was not an improvement in the milk. He stopped the use of the meal and there was no more complaint. But its worst effects are seen in the cheese made from this milk. In the first place, it takes about one-third more annatto to color the cheese, which at once shows the presence of an undue amount of acid. In the second place, the milk has to be heated much higher than usual, and even then it is impossible to bring the curds to a proper consistency. They remain throughout soft and salvey, and will not cure down firm and solid. A Chicago dealer lately wrote to one of his consigners in regard to his cheese as follows:

"'They have the appearance of being finely made, but, on inserting the tryer the plug comes out porous and gritty; and on holding them any length of time they seem to rot and get bad. There is something in the milk, in my judgment, that causes these conditions. The cows are fed on something that is sweet, or foreign to their customary feed. The cheese seems precisely like those of a certain factory which I handled last year, which rotted down in thirty days, causing a loss to me after I had sold them. Some of my customers refused to pay at all. After investigation I found the cows had been fed on glucose (meal), which invariably produces this kind of cheese.'

"This is only a single example of experience which has been repeated in various parts of the country. And it shows that the use of this article is one which is liable to cause serious loss to everybody connected with it. A condensed milk factory, located in a village only a few miles east of here, lost several thousands of dollars last season because some of its patrons used glucose meal as food for their cows. The condensed milk prepared from it was sent back to the factory by those who had purchased it, as wholly unfit for any kind of use.

"With facts like these, concerning which there can be no sort of question, our dairymen must see that it would be the height of folly to commence, or, if already commenced, to persist in the use of sugar meal for the mere sake of a little increase in the yield of milk. In the end it will inevitably result in serious loss either to themselves or to the factory to which they send their milk. And if it is discovered that certain patrons are feeding the meal, the factoryman himself should take the matter in hand, and insist that the practice be done away with. It is an injustice not only to himself but to the patrons of his factory. Cheese this year are sold upon their merits, and not upon the reputation of the establishment where they are made. Under this system, stock which is made out of glucose milk will very soon tell its own secret and ruin the name of the factory which sends it forth."

I have no doubt, if the recommendations made were all fully and carefully carried out, the glucose factory in Detroit *could* be run without causing nuisance. The case against the Company has not been brought to a final hearing, the entire testimony not having been taken. All that the Board of

Health, as well as citizens, want is that the Company shall conduct its manufacturing business without creating a public nuisance. If it cannot, the sooner it moves its factory to the country the better.

There is less disposition on the part of the people to be lenient with the Company, from the fact that the product of its manufacture is extensively, almost exclusively, used by the purchasers thereof as a means of adulteration and fraud. Mr. George R. Angell, in a letter to the Boston *Daily Advertiser*, published Sept. 1, 1880, says:

"Glucose is a cheap substitute for sugar. It is made in Germany from rags. It can be made from sawdust. It is generally made in this country by boiling corn starch in dilute sulphuric acid (oil of vitriol). It has grown in a few years from nothing to most colossal proportions. A single factory uses in making it over five million bushels of corn a year; another more than two millions. I am told that it sometimes sells in large quantities as low as two cents a pound.

"Dr. T. D. Williams, of Chicago, recently analyzed over a hundred samples of confectionery there, and found more than seventy per cent. were made wholly or in part of glucose. He also recently analyzed six samples of *brown* sugar procured from six different sources, and found they *all* contained glucose. Two of them, very light colored, dry and apparently fine articles, contained 33⅓ and 41⅓ per cent. of glucose. A. Casamajor, chemist, in a paper read before the American Chemical Society, March 4, 1880, says he has found *refined* sugars largely adulterated with glucose.

"Dr. O. W. Wight, Health Commissioner of Milwaukee, writes November 8, 1879, that a chemist in charge of a glucose factory tells him that about *twenty* per cent. of glucose is put into *granulated* sugars; *sixty* to *seventy* per cent. into some *brown* sugars, and about *forty* per cent. into *candies;* that it is largely put into honeys, and constitutes the greater portion of many syrups.

"Dr. Kedzie, President of the Michigan State Board of Health, some time since analyzed seventeen table syrups, and found fifteen of them made of glucose. In twenty samples of table syrups recently analyzed at Chicago, only one was found unadulterated, and several of them were made almost entirely of glucose. In twenty-one samples recently analyzed by Dr. Kedzie, twenty were made wholly or very largely of glucose.

"The editor of the Chicago *Grocer* writes me that *seven-eighths of all the sugars sold in Chicago are adulterated with glucose*, and subsequently states in his paper that seven-eighths of all the syrups sold in that market are of the same kind. I am told by a Chicago sugar-dealer that ship-loads of it are sent to New Orleans to come back as New Orleans sugar and molasses. It is largely used not only by confectioners, but also by bakers, brewers, in jellies, jams, preserves, honey, maple sugar, beers, wines, liquors, and is constantly being put into new uses, and I am informed that it is sold in immense quantities to sugar refiners.

"Recently a Glasgow, Scotland, grocer was fined for selling *American* honey which contained fifty-seven per cent. of glucose. What is the character of this article? *Not as it may possibly be made in a chemist's laboratory at high cost, but as it is made and sold for two or three cents a pound in our markets.* The Chicago *Grocer* of September 25, 1879, says: 'The manufacturers deny admittance to their factories.' The Chicago *Tribune* says: 'The manufacture is carried on with as much secrecy as the illicit distillation of spirits.'

"Professor Charles R. Fletcher, Chemical Lecturer to Boston University, and State Assayer of Massachusetts, writes that he has recently analyzed three samples of best solid glucose and two samples of the syrup, grades A and B, and *in every sample* found free sulphuric acid (oil of vitriol). In one sample of *best* glucose he found *thirty grains* of oil of vitriol to the pound of glucose. In a sample of the best syrup he found nearly as much.

"Dr. Kedzie (before quoted) found in one sample of glucose syrup one hundred and forty-one grains of oil of vitriol and seven hundred and twenty-four grains of lime to the gallon; and in another, which had caused serious sickness in a whole family, seventy-two grains of oil of vitriol, twenty-eight grains of copperas and three hundred and sixty-three grains of lime to the gallon. Dr. T. D. Williams, of Chicago, states that in the various samples of glucose sugars and syrups he has found *in every sample* quantities of free sulphuric acid (oil of vitriol)."

It is very obvious to those who are versed in law, that it does not belong to the Health authority to proceed against glucose and its manufacture, upon the ground that it is used as a means of adulteration and fraud.

Whether glucose is injurious to health, when uncontaminated with substances used to produce it, has not yet been determined. The Board of Health, therefor, can only take cognizance of nuisance that may be caused by its manufacture. As the Michigan Grape Sugar Co. was already in court when my sanitary administration began here, both courtesy and public policy require that it should be left there, till a final decision is reached. If the Superior Court finds that the manufacture of glucose cannot be continued at the factory of the company in Detroit without the creation of nuisance, it has abundant means of enforceing its decision. The sanitary authority can only proceed against a nuisance injurious to health. The court labors under no such restriction; it can take the larger, common law view of nuisance, as not only injurious to health but also, according to Blackstone, as "anything that worketh hurt, inconvenience, or damage." If the Superior Court cannot find nuisance, with its more comprehensive definition of the term, it is very certain that the Board of Health will find itself powerless. As Justice Cooley, with great weight of authority says, "Sanitary officers are not final judges when individual rights are involved. A Board of Health may order the destruction of a mill-dam as a nuisance; but if the owner denies the fact, he is entitled to a trial of it before a jury of his fellows. If the Board were to destroy it by their own authority, they would do it at the risk of being held accountable, if the public sentiment, as expressed in the verdict of a jury, did not conform to their own conclusion. This is abundant protection against arbitrary action by these Boards; for though there is always a presumption in favor of their orders, when they are made upon subjects within their jurisdiction, the presumption is not conclusive, and the leanings of a jury are likely to be against whatever to them has an appearance of being arbitrary or oppressive."

V.—THE WATER SUPPLY OF DETROIT.

Soon after I took charge of the Health Department of this city, I wrote to Prof. J. W. Mallet, F. R. S., of Virginia University, who had some time been in charge of an extensive investigation of suspicious water supplies in the United States, under direction of the National Board of Health, requesting him to undertake a chemical examination of the Detroit water. Prof. Mallet responded promptly, as follows:

NATIONAL BOARD OF HEALTH,
UNIVERSITY OF VIRGINIA, Oct. 12, 1881.

DR. O. W. WIGHT,
Health Officer, Detroit, Mich.:

DEAR SIR—I am in receipt of your letter of the 10th inst. The examination of the water you mention would probably not come within the scope of the investigation with which I am charged, but in any case I am unable to undertake it, as the investigation is now being closed, and by the time samples of the water could reach me, I shall no longer have the services of the analysts who have been at work for some months past.

Very respectfully yours,
J. M. MALLET.

In the midst of pressing work of various kinds, the Detroit water supply dropped out of sight for several months. At length an article appeared in a leading newspaper, which seemed to represent the scope of complaints made from time to time by an uncertain percentage of citizens, about the water supplied to the city. As fairly representing that side of the question, I here reproduce the article, as follows:

"If there is one thing about Detroit of which her citizens are more proud than any other, it is the majestic river from which they receive, or imagine they receive, pure, sparkling water.

"When the discovery is made that the water supply of some less fortunate city is full of impurities, the people of Detroit feel thankful that they are not situated as others are. A truly loyal Detroiter never drinks in the presence of a foreigner without first holding aloft the goblet and calling his attention to its clear, limpid contents,and doing his best to make the stranger wish his lot had been cast, like Detroit's, by the pure waters. Before quaffing the contents of the goblet, set it down; tie a piece of cotton around the hydrant in such a way that it forms a bag, and turn on the water. While it is running out and being strained through the cloth, consider for a few moments what the water has to pass through before it reaches the consumer.

"It comes from the shallow, marshy Lake St. Clair, where it has been spread out as in a flat pan, and where it has for weeks been brought in contact with all classes of decaying vegetable matter. From this source it passes through the inlet pipe into a large basin,which was scooped out of a marsh. Here it has an opportunity to settle, to a certain extent. The condition of the bottom of this settling pool may easily be imagined. For months it has been receiving water charged with vegetable matter, and a layer of sediment has been formed from the settlings. Water from this slimy pool is pumped through mains which have not been thoroughly cleansed for years, and thus delivered to the unguarded citizen. Now turn off the water and remove the cloth from the hydrant. You will find it coated with slime. Rinse it in the goblet of water which a moment ago seemed so harmless, and before it settles, place a drop on the glass slide of a powerful microscope. At first only a beautiful mass resembling weeds is seen. This mass embraces bacillariæ and long, beautiful stems of desmidiæ, together with confervæ, all of which are loaded with disease, and are the most potent sources of malaria, typhoid fever and diphtheria.

"But the vegetable matter is not all that is seen through the microscope. Little semi-transparent objects are seen to dash recklessly about, some with no apparent object, while others move in a circular path. One of these animals, somewhat larger than the others, has fastened itself by a fine membrane to a stem of desmidiæ, and with open mouth is swinging slowly around. Suddenly it changes its form, rolling up like a ball. In this shape it remained but a second, when it again expands and resumes its journey around its small circle, only to contract itself once more as it did at first when some smaller species of animalculæ comes within the radius of its circle and is gobbled by this monster. This one is called the rotatoria. A moving mass now comes within the field of the microscope. It seems to be composed of small globules, which are forever changing their relative positions, and in so doing altering the shape of the mass. It cannot be seen to have any organization and is the lowest type of animal life to be found in the water drop. After moving a short distance it divides and each part goes on as did the whole. This one is called the ameba.

"Other small animals go racing through the drop, and a few minutes of watching will show that it is infested by infusoria, trichodena and anarthropoda, all of which, together with the vegetable matter alone described, are taken into the system in drinking a single glass of water. Some of these animalculæ have been found alive in ice, and some in water which has been boiled, showing that they are extremely tenacious of life.

"The only means by which this water may be rendered fit for use is that of filtering, and this remedy should be applied at once. When water is in the condition above described in May, what can be its state by midsummer, the season during which these species of animal and vegetable life flourish best? An examination of some city water was made one evening last week by J. F. Duncan, optician at M. S. Smith & Co.'s, and all the organizations herein described were found."

The Secretary of the Water Board brought the article to me at the close of office hours and requested an immediate opinion on the subject. I told him that such an opinion as he needed could only be given after a thorough investigation. He said that his Board would meet the next morning, and he wished to lay before them the impressions, at least, if not the opinion of the Health Officer. I promised to give him my views on the question of the water-supply of Detroit, derived from a general knowledge of its source, and wrote him the same evening the following communication:

DETROIT, May 15, 1882.

HENRY STARKEY, ESQ.,
Secretary of Water Commissioners:

DEAR SIR—At the close of a day of terrible work you refer to me an article which appeared in the *Free Press* of last Sunday on the drinking water of Detroit, for a sanitary opinion.

Without time and special investigation it is impossible to give you an opinion of positive import of the quality of the water supply of our beautiful city. It is not at all difficult to give you a negative opinion as to the sanitary value of the optical examination narrated in the article of last Sunday.

The observer saw, or thought he saw, desmidiæ (minute algæ), bacilariæ (a species of diatom) and confervæ (a species of flag resembling tangled skeins of silk), all very harmless things, notwithstanding the formidable names, and came to some very unwarrantable conclusions. Dr. Parkes, a very eminent sanitary authority, says: "Algæ and diatoms are found in almost all running streams, and algæ are also seen in many well waters. They cannot be held to indicate any great impurity, and to condemn water on account of their presence would be really to condemn all waters, even rain."—(Practical Hygiene, 5th edition, p. 65.) The conclusion of our amateur sanitarian, that all of these things "are loaded with disease and are the most potent sources of malaria, typhoid fever and diphtheria," will be astounding news to even tyros in medical science.

What our optical observer says of infusoria, which he found in strained and concentrated sediment of Detroit drinking water, is not entitled to much hygienic weight.

I endeavored to procure, half a year ago, a chemical analysis of the Detroit water by a very eminent chemist at that time in the employ of the National Board of Health, but was a little too late in my application. In order to set at rest all curiosity and amateur conjecture, it might be well, at an early day, to procure an authoritative microscopic examination and chemical analysis of our water supply. I venture to predict that it will be found purer than the water supply of any large city in America. The in-take is entirely above the sewage outfall of the city. Lakes Superior, Michigan and Huron collect their waters from the uplands of the central portion of the North American continent, and pour them in a mighty river toward the ocean by our doors. The winds and the waves of these great inland, unsalted seas keep the waters pure as the fountains gushing from the primeval rocks. A little vegetable matter and harmless clay may be infused in shallow St. Clair, a little needless "dead bree" of lizard and decaying acquatic plants may be added in the "settling basin," but no contamination at all to be compared to the excretal pollution that infects the water supply of Boston, New York, Philadelphia, Cincinnati or Chicago, soils the water that Detroit gathers for her daily use from the greatest and purest reservoirs in the world.

Make the machinery of distribution as nearly perfect as possible, and "go slow" in adopting any scheme for filtering 20,000,000 gallons of already good water daily. No drinking water is without microscopic life, both vegetable and animal. These "fine herbs" and minute "criters," invisible to the naked eye, are for the most part good to eat, like raw cabbage and oysters. The poisonous ones flourish in stagnant water, and in water impregnated with the drainage of barn-yards and slaughter houses, of kitchens and factories, of grave-yards and privies, from all of which Detroit water is remarkably free.

Respectfully yours,

O. W. WIGHT, M. D.,

Health Officer.

I attached no particular significance to the communication, yet the daily press, and volunteer contributors to the press, commented extensively on it, thereby indicating that the people are interested in the subject. The Board of Health determined to settle the question by procuring an authoritative chemical analysis of the Detroit water. The President of the Board, Dr. D. O. Farrand, negotiated for such analysis, through Mr. E. S. Sherrill, with Prof. Prescott and Mr. Wrampelmeier, of Michigan State University, both of them competent analytical chemists. The following is the Health Officer's letter of instruction to Mr. Sherrill, for obtaining specimens of the water, and a specimen of the earth from the settling basin, and transporting the same to the chemists:

OFFICE OF THE BOARD OF HEALTH,
DETROIT, June 8th, 1882.

MR. E. S. SHERRILL:

DEAR SIR—You are hereby requested and directed to procure from a wholesale druggist three strong glass bottles, glass-stoppered, such as are used for storing acids, holding three gallons each;[1] to wash said bottles thoroughly clean; to fill one with water from the Detroit river as nearly as practicable at the point of intake of the public water supply, another from the pumping well at the pumping works, and the third from a constantly running hydrant in the city, first rinsing each bottle out at least three times with water from the place where it is finally filled, also taking pains to avoid air bubbles in filling; to seal up the bottles when filled as aforesaid; to mark the bottles with numbers for your private reference; to have the bottles thus filled sealed and marked, transported under your own personal care and observation to the State University at Ann Arbor, and there to deliver the same to Prof. Prescott and Mr. Wrampelmeier, for chemical analysis according to sealed instructions from this office, to be delivered by you at the same time. You will also procure an ample specimen of the earth excavated from the "settling basin" at the water works, and deliver it simultaneously to the same chemists for complete quantitative analysis.

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[1] It was found impossible to procure such bottles holding three gallons; consequently three bottles of one gallon capacity were substituted for each three gallon bottle ordered; thus providing for three gallons of each water. It made no difference whether the required three gallons were in one or three bottles.

Very truly yours,

O. W. WIGHT, M. D.,

Health Officer.

The following is Mr. Sherrill's reply, after executing the order:

DETROIT, Mich., June 12, 1882.

O. W. WIGHT, M. D.,

Health Officer:

DEAR SIR - I would hereby inform you that I have minutely carried out the instructions of your communication of June 8th, 1882, relative to the collection and deliverance to Prof. A. B Prescott and Mr. T. J. Wrampelmeier, chemists, of water from different points in the city's water supply, and of clay from the bottom of the settling basin.

The samples were labled as follows:

The water from the west Fort street hydrant	"A."
The water from the pumping well	"B."
The water from the river at the inlet pipe	"C."
Clay	"Settling Basin Clay."

The sealed instructions entrusted to my care were delivered to the aforesaid chemists at the same time as the samples.

Very respectfully,

E. S. SHERRILL.

The following is the letter of instruction to the chemists:

OFFICE OF THE BOARD OF HEALTH,

DETROIT, June 8th, 1882.

To Prof. A. B. PRESCOTT and

Mr. T. J. WRAMPELMEIER,

Of the State University, Ann Arbor, Mich.:

GENTLEMEN—Mr. E. S. Sherrill, of Detroit, will hand you this, when he delivers to you three waters in sealed glass bottles, glass stoppered, holding three gallons each, and a specimon of earth, for chemical analysis. The Detroit Board of Health desires you to make a very thorough analysis of the three waters, estimating, as expressed in Mr. Wrampelmeier's letter to Mr. Sherrill, under date of May 30, 1882, chlorine in chlorides, phosphoric acid in phosphates, nitrogen in nitrates, free ammonia, albuminoid ammonia, oxygen absorbed in fifteen minutes, oxygen absorbed in four hours, hardness before boiling, hardness after boiling, total solids, microscopic examination of deposit, presence of spores of sewage fungus, by Heisch's test, etc.

Please determine amount of albuminoid nitrogen (in milligrams per litre) by Wanklyn & Chapman's method, with alkaline solution of potassium permanganate, and by Frankland & Armstrong's method of combustion analysis. In estimation of organic matter, please give the ratio of animal and vegetable.

Please give a full "opinion" of the qualities of the waters, with the reasons therefor, with abundant comparisons with other waters.

A quantitative analysis of the specimen of the earth is desired.

The Board wishes that the analysis should be signed by you conjointly.

Respectfully yours,

O. W. WIGHT, M. D.,
Health Officer.

The following is the letter of the chemists acknowledging receipt of waters and clay to be[1] analyzed, also of accompanying instructions:

ANN ARBOR, Mich., June 12, 1882.

DEAR SIR—We beg to acknowledge the receipt of your letter of instructions with reference to the analysis of the water. We have received, also, through Mr. E. S. Sherrill, specimens of the three waters in glass stoppered, sealed bottles—three bottles of each, labeled respectively A^1, A^2, A^3; B^1, B^2, B^3; C^1, C^2, C^3; also a jar containing about a pint of substance, and labeled "Settling Basin Clay."

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[1] This letter is here given for the purpose of showing that the instruction of the Health Officer to verify the results of the analysis by the combustion process, could not be wholly complied with The instruction would be regarded as needlessly exacting.

We will proceed at once to make a complete examination of the waters, for contamination, according to the methods mentioned in previous correspondence, estimating chlorine in chlorides, phosphoric acid in phosphates, nitrogen in nitrates, ammonia, albuminoid ammonia, oxygen absorbed in 15 minutes and 4 hours, hardness before and after boiling, total solids, other impurities (when possible), the principal inorganic constituents, making a microscopical examination of the deposit, and Heisch's test for spores of sewage fungus.

Our reasons for not including Frankland's and Armstrong's method of estimating organic matter, are as follows: Only a small minority of analysts use the method, whereas Wanklyn's method is in almost universal use, and an analysis of a water, of course, has value only by comparison with analyses of waters of known effect. We do not think it is possible to draw conclusions by comparing results obtained by Frankland's method, with results obtained by Wanklyn's method. Furthermore, as, after investigation, we have favored Wanklyn's method, we have never deemed it necessary to provide ourselves with the special apparatus required for Frankland's method.

The scheme we suggest above is the one adopted by the Society of Public Analysts of England.

Very truly yours,
A. B. PRESCOTT,
T. J. WRAMPELMEIER.

To O. W. Wight, M. D.,
Health Officer, Detroit.

It is necessary to bear in mind that the water marked "A" was taken from a running hydrant, in the city; that marked "B," from the pumping well, after passing through the settling basin, and that marked "C," from the intake in the river. The significance of some minor differences in the analyses can then be fully appreciated. The chemists have done their work well; in fact, the State of Michigan has reason to be proud that such analytical work, equal to the best in the world, can be done in the laboratory of her university. Without further comment, the report of the chemists is here given, as follows:

ANN ARBOR, Mich., July 3, 1882.

O. W. WIGHT, M. D.,
Health Officer, City of Detroit, Mich.:

DEAR SIR—We submit below a report of our analyses of three waters of the Detroit water supply, marked respectively, "A," "B" and "C," also of the sedimentary material, marked "Earth from the Settling Basin," all as received from your office on June 12, 1882.

I.—APPEARANCE.

a. *Clearness.*—In a column of six inches, and in comparison with pure distilled water, both being held against a black ground:
  "A." Slight turbidity perceptible.
  "B." Very slight turbidity—less than that of "A."
  "C." The same as "B."

b. *Color.*—In a column of eighteen inches, and in comparison with pure distilled water, both being held before a white ground:
  "A." A very slight brownish tinge perceptible.
  "B." The same as "A."
  "C." The same as "A."

c. *Odor.*—After warming at 100° F. in a closed bottle:
  "A." A barely perceptible odor.
  "B." No odor.
  "C." No odor.

d. *Microscopic examination.*—Five days after the water was taken:
  "A." Bacteria, diatoms, and confervæ identified.
  "B." Bacteria, diatoms, confervæ, desmidiæ.
  "C." Bacteria, diatoms, desmidiæ.

The results of the microscopic inspection, compared with those of waters known to be wholesome, and according to the best authorities, as well as from our own experience, cannot be given as unfavorable to these waters. (See Farlow on Growths in Drinking Water, Harvard Univ., 1880, Report of Depart. of Health, pp. 137, 131, 150. Also, McDonald's Water Anal., pp. 32, 33.)

II.—ORGANIC CONTAMINATIONS.

a. *Free Ammonia.*—"Wanklyn's Method:"

"A." 0.03 part per million parts of water.
"B." 0.07 " " "
"C." 0.024 " " "

b. *Albuminoid Ammonia.*—"Wanklyn's Method:"

"A." 0.06 part per million parts of water.
"B." 0.112 " " "
"C." 0.05 " " "

Comparisons for a and b:

CROTON WATER, NEW YORK, NOV., 1878,
Free Ammonia.......................... 0.015 part per million.
Album. " .... 0.130 " "
(Waller, Jour. Am. Chem. Society, iv., 18.)

April 4, 1881,
Free Ammonia.......................... 0.02 part per million.
Album. " .... 0.11 " "

April 22, 1881,
Free Ammonia.......................... 0.016 part per million.
Album. " .... 0.117 " "

PHILADELPHIA, WATER OF SCHUYLKILL, 1881,
Free Ammonia.......................... 0.08 part per million.
Album. " .... 0.145 " "

BALTIMORE CITY WATER, PROF. REMSEN, 1881,
(The water becoming offensive.)
Free Ammonia.......................... 0.056 part per million.
Album. " .... 0.132 " "

LONDON PUBLIC WATERS, SEPT., 1881,
New River.
Free Ammonia.......................... 0.0085 part per million
Album. " .... 0.02 " "

Grand Junction.
Free Ammonia.......................... 0.001 part per million.
Album. " .... 0.095 " "

EDINBURGH PUBLIC WATER, SEPT., 1881,
Free Ammonia.......................... 0.034 part per million.
Album. " .... 0.091 " "

The results of free and albuminoid ammonia are very favorable for waters "A" and "C," and are not condemnatory of water "B," though leaving the latter in some doubt, if judged upon the single evidence of Wanklyn's method. When the albuminoid ammonia is over 0.10 per million, it becomes a suspicious sign, according to Mr. Wanklyn, but is not evidence of bad quality unless over 0.15 per million.

c. Oxygen Consumption.—The Permanganate method, conducted at 80° F., and under the conditions placed by the Society of Public Analysts of Great Britain:

OXYGEN CONSUMED IN ONE-QUARTER HOUR.

"A,"	0.36	part per million.
"B,"	0.40	" "
"C,"	0.40	" "

IN FOUR HOURS.

"A,"	1.00	part per million.
"B,"	0.90	" "
"C,"	1.00	" "

Comparisons for c:

PHILADELPHIA, JULY, 1881,

Schuylkill water, 4 hours	0.90	part per million.

LONDON, SEPT., 1881,

New River water, ¼ hour	0.30	part per million.
" " 4 hours	0.44	" "
Grand Junction, ¼ hour	0.09	" "
" " 4 hours	1.40	" "

EDINBURGH, SEPT., 1881,

City water, ¼ hour	0.18	per part million.
" 4 hours	1.46	" "

The results of oxygen consumed from permanganate are favorable for all of the three waters.

III.—PREVIOUS ORGANIC CONTAMINATION.

a. Nitrogen in Nitrates:

"A,"	0.32	part per million.
"B,"	0.16	" "
"C,"	0.16	" "

Comparisons for a:

CROTON WATER, NEW YORK,

July, 1881, Waller	0.198	part per million.
November, 1881, Waller	0.181	" "

LONDON WATERS, SEPT. 1881,

New River	2.7	part per million.
Grand Junction	3.0	" "

EDINBURGH WATER,

September, 1881	a trace.

The results obtained in estimation of the nitrates are very favorable for all of the waters, not approaching nearly the limit of dangerous quantities.

b. *Phosphoric Acid in Phosphates:*

"A." None.
"B." Very slight traces.
"C." None.

c. *Chlorine in Chlorides:* (Must be high in any case of sewage contamination.)

"A,"	7.5	parts per million.
"B,"	7.5	" "
"C,"	7.5	" "

Comparisons for c:

PHILADELPHIA, 1881,

Schuylkill water.	3.8 to 8.1 parts per million.

EDINBURGH WATER,

September, 1881	9.1 parts per million.

LONDON, SEPT., 1881,

New River	16.0 parts per million.

CROTON WATER, NEW YORK,

Leeds' analysis, June 1881	3.5 parts per million.

The quantity of chlorides is not at all in excess of that present in many good public waters.

IV.—TOTAL SOLIDS.

(Residue dried at 220° F.)

"A,"	118.8	parts per million.
"B,"	118.4	" "
"C,"	114.0	" "

Comparisons:

NEW YORK, CROTON WATER,

Prof. Chandler, 1869	117.8	parts per million.
Mr. Waller, 1881	54.3	" "

LONDON, SEPT., 1881,

New River	268.	parts per million.
Grand Junction	262.	" "

EDINBURGH, SEPT., 1881,

City water	89.	parts per million.

PHILADELPHIA, 1881,

Schuylkill	95.	parts per million.

V.—LOSS AND APPEARANCE UPON IGNITION OF THE RESIDUE.

"A,"—41.2 parts per million.	Slight odor; darkens somewhat.
"B,"—42.4 " "	Same as "A."
"C,"—40.0 " "	Odor as with "A," but darkens more.

VI.—HARDNESS, BY CLARKE'S SCALE.

(Soap Decomposition.)

	Before boiling.	After boiling.
"A,"	6°	4.3°
"B,"	5.8°	4.0°
"C,"	5.8°	4.3°

Comparisons as to hardness:

NEW YORK. CROTON WATER.

Waller's averages of six years, before boiling............... 3.2°

PHILADELPHIA, 1881,

Schuylkill water, before boiling...... 6° After boiling......5.5°

LONDON, SEPT., 1881.

New River, before boiling........ 14° After boiling........ 3°

VII.—MINERAL CONSTITUENTS.

Potassium, sodium, magnesium, calcium, iron (traces). aluminium (traces),—sulphates, chlorides, carbonates, silica. Of these, the following estimations were made in quantity (given as parts per million):

	"A."	"B."	"C."
Magnesium, as M_gO	12.1	12.7	12.3
Calcium, as C_aO	35.5	36.0	34.8
Sulphuric Acid, as SO_3	5.6	6.0	5.6
Silica, as S_iO_2	6.6	6.2	8.9

Hydrochloric Acid, as C_l, given above (III, *c*).

SUMMARY.

We do not find a single feature of these waters to present a decisively unfavorable indication. In connection with the microscopic examination, above given, Heisch's culture test, with sugar, for spores of sewage fungus, was faithfully carried out, and an entirely negative result obtained. Judging from all the results, in accord with the best authorities upon the interpretation of analyses, the conclusion must be entirely favorable to the wholesome quality of the waters. The figures obtained, and detailed above with comparisons and interpretations, are tabulated as follows:

	Parts per Million.			Grains per U. S. Gallon.		
	"A."	"B."	"C."	"A."	"B."	"C."
Free ammonia	0.03	0.07	0.024	0.0017	0.0041	0.0014
Albuminoid ammonia	0.06	0.112	0.05	0.0035	0.0065	0.0029
Oxygen consumed—						
In ¼ hour	0.36	0.40	0.40	0.0209	0.0233	0.0233
In 4 hours	1.00	0.90	1.00	0.0583	0.0524	0.0583
Nitrogen in Nitrates	0.32	0.16	0.16	0.0186	0.0093	0.0093
Phosphoric acid in phosphates.	None.	Very slight traces.	None.			
Chlorine in chlorides	7.5	7.5	7.5	0.437	0.437	0.437
Total solids (220° F.)	118.8	118.4	114.0	6.926	6.902	6.646
Loss by ignition	41.2	42.4	40.0	2.402	2.471	2.332
Mineral constituents-						
Magnesium oxide	12.1	12.7	12.3	0.705	0.740	0.717
Calcium oxide	35.5	36.0	34.8	2.069	2.098	2 028
Sulphuric anhydride	5.6	6.0	5.6	0.326	0.349	0.326
Silicic anhydride	6.6	6.2	8.9	0.384	0.361	0.518
Hardness—						
Before boiling	6.0°	5.8°	5.8°			
After boiling	4.8°	4.0°	4.3°			

EARTH FROM THE SETTLING BASIN.

Appearance, a greenish sand, wet, and with fragments of vegetable fibre. The odor was very slight. The material was thoroughly mixed, a sample taken, and dried at 212° F., to a constant weight. Its analysis gave the following results:

Moisture (by absorption)	5.120
Organic matter	6 535
Silica	76.838
Ferric oxide	2.889
Alumina	1.366
Lime	3.858
Potassa	3.711
Sulphuric acid (anhydride)	0.434
Chlorine	0.194
Soda	a trace.
Magnesia	a trace.
	100.945

Respectfully submitted,

ALBERT B. PRESCOTT,
THEODORE J. WRAMPELMEIER.

VI.—EXPENSES OF HEALTH DEPARTMENT.

FROM OCTOBER 1, 1881, TO JULY 1, 1882.

Oct. 4,	Advertising health ordinance	$ 15	40
	Post and Tribune Job Co., blanks	151	34
	T. Nourse, blank books and stationery	38	84
	Salary of Health Officer	250	00
	Postage	5	00
Nov. 27,	Salary for Health Officer	250	00
	" " clerk	78	00
	" " clerk	33	00
Dec. 6,	A. Bassett, disinfectants	5	94
13,	F. W. Rowley, disinfecting houses	34	80
14,	T. Nourse, stationery	79	10
	Salary of Health Officer	250	00
	" " clerk	78	00
	" " clerk	78	00
	Postage	10	00
1882.			
Jan. 10,	A. Bassett, disinfectants	9	45
	F. W. Rowley, disinfecting houses	24	60
15,	Post and Tribune Job Co., blanks	9	52
	" " " circulars	12	22
	" " " Dec. mortuary record	35	00
24,	F. W. Rowley, disinfecting houses	30	00
	Salary of Health Officer	250	00
	" " clerk	93	00
	" " clerk	78	00
	Office rent to July 1, 1882	150	00
Feb. 7,	F. W. Rowley, disinfecting houses	27	00
10,	T. Nourse, stationery	7	77
16,	Post and Tribune Job Co., Jan. mortuary report	9	40
	A. Bassett, disinfectants	14	62
	Telephone and Telegraph Co., rent of telephones	20	18

Feb.		Salary of Health Officer	$ 250 00
		" " clerk	92 40
		" " clerk	79 20
Mar.	4,	A. Bassett, disinfectants	14 60
	14,	Postage	10 00
	27,	Post and Tribune Job Co., sundries	26 32
		F. W. Rowley, disinfecting houses	27 00
		Salary of Health Officer	250 00
		" " clerk	102 30
		" " clerk	89 10
April	3,	T. Nourse, stationery	2 65
		F. W. Rowley, disinfecting houses	32 40
	18,	Post and Tribune Job Co., blanks, etc	50 50
		F. W. Rowley, disinfecting houses	21 60
		Salary of Health Officer	250 00
		" " clerk	99 00
		" " clerk	82 50
May	1,	T. Nourse, stationery	3 13
		Telephone and Telegraph Co., rent of telephones	27 50
	2,	F. W. Rowley, disinfecting houses	22 20
		A. Bassett, disinfectants	9 64
	17,	Post and Tribune Job Co., May mortuary report	9 40
		F. W. Rowley, disinfecting houses	30 30
		Salary of Health Officer	250 00
		" " clerk	102 30
		" " clerk	89 10
June	2,	T. Nourse, stationery	5 10
	26,	F. W. Rowley, disinfecting houses	27 00
		Salary of Health Officer	250 00
		" " clerk	99 00
		" " clerk	85 80
		Total	$4,618 22

MORTUARY AND METEOROLOGICAL TABLES.

"*The fact that, in modern times, the subject of hygiene generally, and State Medicine in particular, has commenced to attract so much the public attention, is undoubtedly owing to the application of statistics to public health. It is impossible for any nation, or for any government, to remain indifferent when, in figures which admit of no denial, the national amount of health and happiness, or disease and suffering, is determined.*"—PARKES.

MORTUARY AND METEOROLOGICAL TABLES.

The statistics of this first report of the Health Department of Detroit are necessarily meager, but they throw some light on the sanitary condition of the city. A period of only one half year is embraced in the tables. The figures, so far as they go, are reliable. The death-rate of Detroit appears from this record of six months to be a little over twenty-one per thousand of population. The half year has not been unusually sickly, and this percentage may be regarded as near the present average of mortality. While we may congratulate ourselves that life is here worth fifty per cent. more than in New York City, where the death-rate for the last year has been about thirty-one per thousand, nevertheless we should not complacently content ourselves with the reflection that we are less guilty of sanitary sin than our neighbors, but strive to reach a higher degree of hygienic godliness through the channels of cleanliness. The mortality of Detroit, with its incomparable facilities for carrying out sanitary improvements, can be reduced to fifteen or sixteen per thousand. That would be adding still another fourth to the value of life here. "It is as certain," says Dr. Farr, "that a high mortality can be reduced, by hygienic appliances, down to a certain limit, as it is that human life can be sacrificed."

The meteorological tables are according to the plan adopted by the Signal Offices of the Federal Government. This department is indebted for them to C. F. R. Wappenhans, Obs. Sergt. Signal Service U. S. A., stationed at Detroit. The local meteorology can be profitably studied in connection with the prevalence of certain diseases, after a sufficient series of observations shall be recorded.

MONTHLY REPORT OF DEATHS

FOR

DECEMBER, 1881.

CAUSES OF DEATH.

CLASS I—Zymotic.

ORDER 1—*Miasmatic.*

Cholera Infantum	1
Cynanche trachealis (Membranous Croup)	9
Diarrhœa chronica (Chronic Diarrhœa)	1
Diphtheria (Diphtheria)	14
Entero-colitis	2
Erysipelas (Erysipelas)	1
Febris biliosa (Bilious Fever)	2
Febris remittens (Remittent Fever)	10
Febris typhoides (Typhoid Fever)	7
Pertussis (Whooping Cough)	1
Scarlatina (Scarlet Fever)	4

ORDER 3—*Dietic.*

Delirium alcoholicum (Delirium Tremens)	1

CLASS II—Constitutional.

ORDER 1 *Diathetic.*

Anasarca (General Dropsy)	2
Asthma (Spasmodic Asthma)	1
Carcinoma (Cancer)*	6
Rheumatismus (Rheumatism)	1

ORDER 2—*Tubercular.*

Hydrocephalus	2
Meningitis tuberculosis (Tubercular Meningitis)	4
Peritonitis tuberculosis (Tubercular Peritonitis)	2
Phthisis pulmonalis (Consumption)	18
Tabes Mesenterica (Marasmus)	4

CLASS III—Local.

ORDER 1—*Nervous.*

Apoplexia (Apoplexy)	4
Convulsio (Convulsions)	17
Encephalitis (Inflammation of the Brain)	2
Meningitis	3
Paralysis (Palsy	1
Paraplegia (Palsy of Lower Extremities)	1
Tetanus (Lockjaw)	1

ORDER 2—*Circulatory.*

Degeneratio cordis (Fatty Degeneration of Heart)	1
Embolismus (Embolism)	3
Hydrops Pericardii (Dropsy of Heart)	3
Hypertrophia cordis (Enlargement of heart)	1
Morbus valvularum cordis (Valvular Disease of Heart)	3

ORDER 3—*Respiratory.*

Apoplexia pulmonalis (Congestion of Lungs)	7
Bronchitis (Bronchitis)	8
Gangrænum pulmonum (Gangrene of Lungs)	1
Pleuro pneumonia (Pleurisy and Inflammation of Lung)	4
Pneumonia (Inflammation of Lung)	10

ORDER 4—*Digestive.*

Entiritis (Inflammation of Bowels)	8
Gastritis (Inflammation of Stomach)	2
Hepatitis (Inflammation of Liver)	2
Hernia (Rupture)	1
Icterus (Jaundice)	1
Intus-susceptio (Invagination of Gut)	1

ORDER 5—*Urinary.*

Nephritis (Inflammation of Kidneys)	1

CLASS IV—Developmental.

ORDER 1—*Children.*

Cyanosis	1
Dentitio (Teething)	1
Partus emortuus (Still-Birth)	13
Partus intempestivus (Premature Birth)	9

ORDER 2—*Women.*

Abortus (Abortion, Miscarriage)	1
Febris puerperalis (Puerperal Fever)	3
Hæmorrhagia post partum (Flooding)	1

ORDER 3—*Old People.*

Senectus (Old Age)	6
—(Senile Debility)	3

ORDER 4—*Nutrition.*

Debilitas (Debility)	12

CLASS V—Violence.

ORDER 1—*Accident.*

Fractura (Fracture) of Thigh	1
Submersio (Drowning)	1
Other causes of violent death	4

ORDER 3—*Homicide.*

Murder and Manslaughter	1

Unknown	2

Total (without still-births and premature births), 216; being 21.177 per thousand of population per annum.

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* Of uterus, 1; of breast, 1; of liver, 1; of œsophagus, 1; not reported, 2.

DECEMBER—Continued.

SEX.

Minors—Male	63	Total Females	107
Minors—Female	60	Total Minors	123
Adults—Male	46	Total Adults	93
Adults—Female	47		
Total Males	109	Whole number	216

AGE.

MALES.	Sin.	M'd	W.	T'l	FEMALES.	Sin.	M'd	W.	T'l
Under 1 year	34	....	....	34	Under 1 year	32	....	....	32
From 1 to 5	15	....	....	15	From 1 to 5	11	....	....	11
From 5 to 10	7	....	....	7	From 5 to 10	10	....	....	10
From 10 to 20	7	....	....	7	From 10 to 20	7	....	....	7
From 20 to 30	8	1	....	9	From 20 to 30	6	6	...	12
From 30 to 40	4	6	....	10	From 30 to 40	2	9	1	12
From 40 to 50	2	3	....	5	From 40 to 50	1	3	....	4
From 50 to 60	....	3	....	3	From 50 to 60	....	1	1	2
From 60 to 70	....	11	....	11	From 60 to 70	....	4	....	4
From 70 to 80	....	4	2	6	From 70 to 80	....	4	4	8
Over 80	....	1	1	2	Over 80	....	5	....	5
Total Males	77	29	3	109	Total Females	69	32	6	107
					Grand total	146	61	9	216

CEMETERIES WHERE BURIED.

Elmwood	54	Free Sons of Israel	2	Elsewhere	19
Woodmere	34	Beth El	—	Special burial in	—
Mount Elliott	101	King David's Lodge	—		
German Lutheran	3	Shaary Zedeck	3	Total	216

NATIVITIES.

Detroit	107	England	10	Russia	1
Michigan	5	France	1	Scotland	6
Other States	18	Germany	22	Sweden	—
Austria	2	Holland	1	Switzerland	2
Belgium	1	Hungary	—	Wales	—
Bohemia	1	Ireland	14	Not stated	3
Canada	14	Italy	—	In transit	—
China	—	Norway	—		
Denmark	—	Poland	8	Total	216

DAILY MORTALITY.

1st	6	12th	10	23d	4
2d	5	13th	6	24th	8
3d	10	14th	6	25th	9
4th	10	15th	8	26th	7
5th	7	16th	6	27th	4
6th	9	17th	11	28th	6
7th	9	18th	6	29th	7
8th	8	19th	7	30th	4
9th	6	20th	4	31st	7
10th	12	21st	6		
11th	2	22d	6	Total	216

MONTHLY REPORT OF DEATHS

FOR

JANUARY, 1882.

CAUSES OF DEATH.

CLASS I—Zymotic.

ORDER 1—*Miasmatic.*

Cholera Infantum	1
Cynanche trachealis (Membranous Croup)	9
Diarrhœa chronica (Chronic Diarrhœa)	1
Diphtheria (Diphtheria)	10
Erysipelas (Erysipelas)	1
Febris biliosa (Bilious Fever)	1
Febris congestiva (Congestive Fever)	1
Febris remittens (Remittent Fever)	4
Febris typhoides (Typhoid Fever)	3
Morbilli (Measles)	1
Parotitis (Mumps)	1
Scarlatina (Scarlet Fever)	6
Tonsilitis (Quinsy)	1
Variola (Small-pox)	2

ORDER 3—*Dietic.*

Alcoholismus (Alcoholism)	1

CLASS II—Constitutional.

ORDER 1—*Diathetic.*

Anasarca (General Dropsy)	2
Asthma (Spasmodic Asthma)	1
Carcinoma (Cancer)*	5
Hydrops (Dropsy)	2
Rheumatismus (Rheumatism)	1

ORDER 2—*Tubercular.*

Hydrocephalus	1
Meningitis Tuberculosis (Tubercular Meningitis)	1
Phthisis pulmonalis (Consumption)	17
Tabes Mesenterica (Marasmus	3
Other Tubercular Diseases	1

CLASS III—Local.

ORDER 1—*Nervous.*

Apoplexia (Apoplexy)	6
Convulsio (Convulsions)	17
Encephalitis (Inflammation of the Brain	2
Epilepsia (Epilepsy)	2
Insania (Insanity)	1
Meningitis	4
Necrencephalus (Softening of Brain)	2
Paralysis agitans (Shaking Palsy)	3
Tetanus (Lockjaw)	1

ORDER 2—*Circulatory.*

Atrophia cordis (Atrophy of Heart)	1
Hypertrophia cordis (Enlargement of Heart)	1
Morbus valvularum cordis (Valvular Disease of Heart)	4
Pericarditis (Inflamma- of membrane covering Heart)	1

ORDER 3—*Respiratory.*

Apoplexia pulmonalis (Congestion of Lungs)	2
Bronchitis (Bronchitis)	10
Pleuritis (Pleurisy)	1
Pleuro Pneumonia (Pleurisy and Inflammation of Lung)	1
Pneumonia (Inflammation of Lung)	12

ORDER 4—*Digestive.*

Cirrhosis	2
Entiritis (Inflammation of Bowels)	1
Gastritis (Inflammation of Stomach)	3
Hepatitis (Inflammation of Liver)	5
Hernia (Rupture)	1
Icterus (Jaundice)	2
Obstipatio (Constipation)	1
Peritonitis (Inflammation of Abdomen)	3
Stomatitis (Inflammation of Mouth)	1

ORDER 5—*Urinary.*

Nephria (Bright's Disease)	1
Nephritis (Inflammation of Kidneys)	1

ORDER 6—*Generative.*

Metritis (Inflammation of Womb)	1
Tumor uteri (Uterine Tumor)	1

CLASS IV—Developmental.

ORDER 1—*Children.*

Cyanosis	2
Partus emortuus (Still-birth)	19
Partus intempestivus (Premature Birth)	4

ORDER 2—*Women.*

Climacteria (Turn of (Life)	1
Eclampsia parturi (Convulsions in Childbirth)	1
Febris puerperalis (Puerperal Fever)	1

ORDER 3—*Old People.*

Senectus (Old Age)	4
—(Senile Debility)	2

ORDER 4—*Nutrition.*

Debilitas (Debility)	5

CLASS V—Violence.

ORDER 1—*Accident.*

Amputatio (Amputation)	1
Venenatio (Poisoning by —)†	1

ORDER 3—*Homicide.*

Murder and Manslaughter	1

Unknown	2

Total (without still-births and premature births), 192; being 18.838 per thousand of population per annum.

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* Of liver, 1; not reported, 4. † Morphine.

JANUARY—Continued.

SEX.

Minors—Male	50	Total Females.	98
Minors—Female	54	Total Minors	104
Adults—Male	44	Total Adults	88
Adults—Female	44		
Total Males	94	Whole number	192

AGE.

MALES.	Sin.	M'd	W.	T'l	FEMALES.	Sin.	M'd	W.	T'l
Under 1 year	25	....	....	25	Under 1 year	26	....	....	26
From 1 to 5	18	....	....	18	From 1 to 5	13	....	...	13
From 5 to 10	3	....	....	3	From 5 to 10	5	....	....	5
From 10 to 20	4	....	....	4	From 10 to 20	10	....	....	10
From 20 to 30	11	1	....	12	From 20 to 30	4	6	....	10
From 30 to 40	2	4	....	6	From 30 to 40	....	7	....	7
From 40 to 50	1	7	....	8	From 40 to 50	1	4	....	5
From 50 to 60		6	....	6	From 50 to 60	....	6	1	7
From 60 to 70	....	6	....	6	From 60 to 70	....	4	3	7
From 70 to 80	....	3	....	3	From 70 to 80	....	5	2	7
Over 80	1	....	2	3	Over 80	...	....	1	1
Total Males	65	27	2	94	Total Females	59	32	7	98
					Grand total	124	59	9	192

CEMETERIES WHERE BURIED.

Elmwood	63	Free Sons of Israel	3	Elsewhere	15
Woodmere	24	Beth El	—	Special burial in	—
Mount Elliott	80	King David's Lodge	—		
German Lutheran	6	Shaary Zedeck	1	Total	192

NATIVITIES.

Detroit	96	England	5	Russia	—
Michigan	5	France	2	Scotland	3
Other States	24	Germany	24	Sweden	—
Austria	1	Holland	2	Switzerland	—
Belgium	—	Hungary	1	Wales	—
Bohemia	1	Ireland	9	Not stated	7
Canada	11	Italy	—	In transit	—
China	—	Norway	—		
Denmark	—	Poland	1	Total	192

DAILY MORTALITY.

1st	12	12th	4	23d	7
2d	3	13th	7	24th	7
3d	9	14th	6	25th	6
4th	5	15th	2	26th	6
5th	6	16th	9	27th	9
6th	5	17th	6	28th	5
7th	3	18th	4	29th	4
8th	5	19th	9	30th	7
9th	3	20th	4	31st	10
10th	7	21st	7		
11th	6	22d	9	Total	192

MONTHLY REPORT OF DEATHS

FOR

MARCH, 1882.

CAUSES OF DEATH.

CLASS I—Zymotic.	
ORDER 1—*Miasmatic*	
Cynanche trachealis (Membranous Croup)	8
Dysenteria acuta (Acute Dysentery)	2
Diphtheria (Diphtheria)	24
Entero-colitis	1
Erysipelas (Erysipelas)	3
Febris congestiva (Congestive fever)	1
Febris remittens (Remittent Fever)	6
Febris typhoides (Typhoid Fever)	2
Morbilli (Measles)	7
Pyæmia (Pyæmia)	1
Scarlatina (Scarlet Fever)	15
Variola (Small-Pox)	2
ORDER 2—*Enthetic.*	
Syphilis tertiara (Tertiary Syphilis)	3
ORDER 3—*Dietic.*	
Alcoholismus—(Alcoholism)	3
Delirium alcoholicum (Delirium Tremens)	2
Rachitis (Rickets)	1
CLASS II—Constitutional.	
ORDER 1—*Diathetic.*	
Arthritis (Articular Rheumatism)	1
Asthma (Spasmodic Asthma)	1
Carcinoma (Cancer)*	5
Hydrops (Dropsy)	3
Rheumatismus (Rheumatism)	5
ORDER 2—*Tubercular.*	
Meningitis tuberculosis (Tubercular Meningitis)	5
Phthisis pulmonalis (Consumption)	31
Tabes Mesenterica (Marasmus)	9
CLASS III—Local.	
ORDER 1—*Nervous.*	
Apoplexia (Apoplexy)	3
Convulsio (Convulsions)	16
Encephalitis (Inflammation of the Brain)	7
Meningitis	7
Necrencephalus (Softening of Brain)	1
Paralysis (Palsy)	2
Tetanus (Lockjaw)	1
ORDER 2—*Circulatory.*	
Atrophia cordis (Atrophy of Heart)	1
Embolismus (Embolism)	2
(Endocarditis (Inflammation of Membrane lining Heart)	1
Morbus valvularum cordis (Valvular Disease of Heart)	4
Syncope (Fainting)	1
ORDER 3—*Respiratory.*	
Apoplexia pulmonalis (Congestion of Lungs)	4
Bronchitis (Bronchitis)	11
Emphysema	1
Pneumonia (Inflammation of Lung)	16
ORDER 4—*Digestive.*	
Ascites (Abdominal Dropsy)	1
Dyspepsia (Indigestion)	1
Entritis (Inflammation of Bowels)	2
Gastritis (Inflammation of Stomach)	1
Peritonitis (Inflammation of Abdomen)	2
Stomatitis (Inflammation of Mouth)	2
ORDER 5—*Urinary.*	
Nephria (Bright's Disease)	3
Nephritis (Inflammation of Kidneys)	1
ORDER 6—*Generative.*	
Metritis (Inflammation of Womb)	1
ORDER 8—*Integumentary.*	
Abscessus (Abscess)	1
CLASS IV—Developmental.	
ORDER 1—*Children.*	
Partus emortuus (Still-Birth)	28
Partus intempestivus (Premature Birth)	6
ORDER 2—*Women.*	
Febris puerperalis (Puerperal Fever	1
Hæmorrhagia post partum (Flooding)	1
ORDER 3—*Old People.*	
Senectus (Old Age)	3
ORDER 4—*Nutrition.*	
Debilitas (Debility)	4
CLASS V—Violence.	
ORDER 1—*Accident.*	
Submersio (Drowning)	1
ORDER 4—*Suicide.*	
Venenatio (Poisoning by —)†	1
Vulnera (Wounds)	1
Unknown	1

Total (without still-births and premature births), 247; being 24.235 per thousand of population per annum.

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*Of liver, 1; stomach 2; uterus, 1; unknown, 1. †Unknown, 1.

MARCH—Continued.

SEX.

Minors—Male	82	**Total Female**	106
Minors—Female	61	**Total Minors**	143
Adults—Male	59	**Total Adults**	104
Adults—Female	45		—
Total Male	141	Whole number	247

AGE.

MALES.	Sin.	M'd	W.	T'l	FEMALES.	Sin.	M'd	W.	T'l
Under 1 year	33	....	....	33	Under 1 year	21	....	....	21
From 1 to 5	36	....	....	36	From 1 to 5	25	....	....	25
From 5 to 10	9	....	....	9	From 5 to 10	8	....	....	8
From 10 to 20	4	....	....	4	From 10 to 20	7	....	....	7
From 20 to 30	13	3	....	16	From 20 to 30	1	8	....	9
From 30 to 40	....	7	1	8	From 30 to 40	....	12	....	12
From 40 to 50	2	7	....	9	From 40 to 50	....	4	1	5
From 50 to 60	....	8	....	8	From 50 to 60	....	2	....	2
From 60 to 70	....	8	....	8	From 60 to 70	....	8	1	9
From 70 to 80	....	7	....	7	From 70 to 80	1	2	3	6
Over 80	1	2	....	3	Over 80	....	1	1	2
Total Males	98	42	1	141	Total Females	63	37	6	106
					Grand total	161	79	7	247

CEMETERIES WHERE BURIED.

Elmwood	74	**Free Sons of Israel**	—	**Elsewhere**	22
Woodmere	40	**Beth El**	1	**Special burial in**	—
Mount Elliott	104	**King David's Lodge**	—		—
German Lutheran	4	**Shaary Zedeck**	2	Total	247

NATIVITIES.

Detroit	185	**England**	7	**Russia**	—
Michigan	14	**France**	—	**Scotland**	2
Other States	21	**Germany**	21	**Sweden**	—
Austria	—	**Holland**	—	**Switzerland**	—
Belgium	—	**Hungary**	—	**Wales**	—
Bohemia	1	**Ireland**	16	**Not stated**	14
Canada	12	**Italy**	—	**In transit**	1
China	—	**Norway**	—		—
Denmark	—	**Poland**	3	Total	247

DAILY MORTALITY.

1st	15	**12th**	7	**23d**	7
2d	6	**13th**	12	**24th**	6
3d	4	**14th**	9	**25th**	4
4th	8	**15th**	12	**26th**	7
5th	7	**16th**	12	**27th**	11
6th	4	**17th**	11	**28th**	7
7th	6	**18th**	3	**29th**	8
8th	6	**19th**	9	**30th**	7
9th	13	**20th**	8	**31st**	6
10th	10	**21st**	8		—
11th	6	**22d**	8	Total	247

MONTHLY REPORT OF DEATHS

FOR

APRIL, 1882.

CAUSES OF DEATH.

CLASS 1—Zymotic.	
ORDER 1—*Miasmatic.*	
Cholera Infantum	2
Cynanche trachealis (Membranous Croup)	4
Dysenteria acuta), Acute Dysentery)	1
Diphtheria (Diphtheria)	8
Febris remittens (Remittent Fever)	8
Morbilli (Measles)	1
Pyæmia (Pyæmia)	2
Scarlatina (Scarlet Fever)	7
Tonsilitis (Quinsy)	1
Variola (Small-Pox)	1
ORDER 2—*Enthetic.*	
Syphilis tertiaria (Tertiary Syphilis)	1
ORDER 3—*Dietic.*	
Delirium alcoholicum (Delirium Tremens)	1
CLASS II—Constitutional.	
ORDER 1—*Diathetic.*	
Asthma (Spasmodic Asthma)	1
Carcinoma (Cancer)*	9
Hydrops (Dropsy)	1
Rheumatismus (Rheumatism)	2
ORDER 2—*Tubercular.*	
Hydrocephalus	1
Meningitis tuberculosis (Tubercular Meningitis)	1
Phthisis pulmonalis (Consumption)	16
Tabes Mesenterica (Marasmus)	10
CLASS III—Local.	
ORDER 1—*Nervous.*	
Apoplexia (Apoplexy)	3
Convulsio (Convulsions)	16
Encephalitis (Inflammation of the Brain)	3
Hemiplegia (Paralysis of one side of the Body)	2
Hydrocephalus acutus (Acute Hydrocephalus)	2
Insania (Insanity)	1
Meningitis	8
Paralysis (Palsy)	1
Paraplegia (Palsy of Lower Extremities)	1
ORDER 2—*Circulatory.*	
Aneurisma (Aneurism)	1
Hydrops pericardii (Dropsy of Heart)	1
Morbus valvularum cordis (Valvular Disease of Heart)	5
Pericarditis (Inflammation of Membrane covering Heart)	1
ORDER 3—*Respiratory.*	
Apoplexia pulmonalis (Congestion of Lungs)	1
Bronchitis (Bronchitis)	5
Gangrænum pulmonum (Gangrene of Lungs)	1
Hydrothorax (Dropsy of Chest)	1
Laryngitis (Inflammation of Larynx)	1
Pleuro Pneumonia (Pleurisy and Inflammation of Lung)	1
Pneumonia (Inflammation of Lung)	17
Pneumothorax	1
ORDER 4—*Digestive.*	
Ascites (Abdominal Dropsy)	1
Entiritis (Inflammation of Bowels)	2
Gastritis (Inflammation of Stomach)	4
Hepatitis (Inflammation of Liver)	6
Peritonitis (Inflammation of Abdomen)	6
Stomatitis (Inflammation of Mouth)	3
ORDER 5—*Urinary.*	
Nephria (Bright's Disease)	1
CLASS IV—Developmental.	
ORDER 1—*Children.*	
Cyanosis	1
Partus emortuus (Still-Birth)	16
Partus intempestivus (Premature-Birth)	10
ORDER 2—*Women.*	
Febris puerperalis (Puerperal Fever)	1
Phlegmasia dolens (Milk Leg)	1
Chronic Pelvic Cellulitis,	1
ORDER 3—*Old People.*	
Senectus (Old Age)	2
—(Senile Debility)	1
ORDER 4—*Nutrition.*	
Debilitas (Debility)	8
CLASS V—Violence.	
ORDER 1—*Accident.*	
Concussio (Concussion of Spine)	1
Fractura (Fracture) of skull	3
Vulnera (Wounds)	1
ORDER 4—*Suicide.*	
Vulnera (Wounds) shooting	1
Unknown	2

Total (without still-births and premature births), 197; being 19.973 per thousand of population per annum.

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* Of face, 1; of stomach, 2; of uterus, 1; unknown, 5.

APRIL—Continued.

SEX.

Minors—Male	58	Total Females	93
Minors—Female	54	Motal Minors	112
Adults—Male	46	Total Adults	85
Adults—Female	39		
Total Males	104	Whole number	197

AGE.

MALES.	Sin.	M'd	W.	T'l.	FEMALES.	Sin.	M'd	W.	T' l
Under 1 year	28	....	...	28	Under 1 year	27	....	....	27
From 1 to 5	16	....	....	16	From 1 to 5	12	....	....	12
From 5 to 10	8	....	....	8	From 5 to 10	8	....	....	8
From 10 to 20	6	...	....	6	From 10 to 20	7	1	....	8
From 20 to 30	5	1	....	6	From 20 to 30	5	4	....	9
From 30 to 40	4	7	....	11	From 30 to 40	2	3	....	5
From 40 to 50	1	7	....	8	From 40 to 50	....	7	....	7
From 50 to 60	....	5	....	5	From 50 to 60	....	2	1	3
From 60 to 70	....	6	....	6	From 60 to 70	....	3	5	8
From 70 to 80	....	6	2	8	From 70 to 80	....	4	1	5
Over 80	....	....	2	2	Over 80	....	....	1	1
Total Males	68	32	4	104	Total Females	61	24	8	93
					Grand Total	129	56	12	197

CEMETERIES WHERE BURIED.

Elmwood	54	Free Sons of Israel	—	Elsewhere	17
Woodmere	23	Beth El	1	Special burial in	—
Mount Elliot	93	King David's Lodge	–		
German Lutheran	9	Shaary Zedeck	—	Total	197

NATIVITIES.

Detroit	98	England	6	Russia	—
Michigan	9	France	—	Scotland	1
Other States	19	Germany	25	Sweden	—
Austria	1	Holland	--	Switzerland	1
Belgium	—	Hungary	—	Wales	—
Bohemia	—	Ireland	10	Not stated	11
Canada	12	Italy	—	In transit	1
China	—	Norway	--		
Denmark	—	Poland	3	Total	197

DAILY MORTALITY.

1st	9	12th	6	23d	6
2d	5	13th	8	24th	3
3d	3	14th	6	25th	7
4th	7	15th	2	26th	6
5th	3	16th	11	27th	7
6th	5	17th	9	28th	8
7th	5	18th	8	29th	12
8th	4	19th	9	30th	2
9th	7	20th	6		
10th	7	21st	12	Total	197
11th	9	22d	5		

MONTHLY REPORT OF DEATHS

FOR

MAY, 1882.

CAUSES OF DEATH.

CLASS I—Zymotic.	
ORDER 1—*Miasmatic.*	
Cynanche trachealis (Membranous Croup)	5
Diarrhœa acuta (Acute Diarrhœa)	1
Dysenteria acuta (Acute Dysentery)	2
Diphtheria (Diphtheria)	12
Erysipelas (Erysipelas)	5
Febris remittens (Remittent Fever)	7
Febris typhoides (Typhoid Fever)	2
Morbilli (Measles)	4
Pyæmia (Pyæmia)	2
Scarlatina (Scarlet Fever)	10
Variola (Small-pox)	3
ORDER 2—*Enthetic.*	
Syphilis tertiaria (Tertiary Syphilis)	1
ORDER 3—*Dietic.*	
Alcoholismus (Alcoholism)	1
CLASS II—Constitutional.	
ORDER 1—*Diathetic.*	
Anæmia (Anæmia)	2
Anasarca (General Dropsy)	1
Asthma (Spasmodic Asthma)	1
Carcinoma (Cancer)*	2
Gangræna senilis (Dry Gangrene)	1
Hydrops (Dropsy)	1
Rheumatismus (Rheumatism)	1
ORDER 2—*Tubercular.*	
Hydrocephalus	2
Meningitis tuberculosis (Tubercular Meningitis)	3
Phthisis pulmonalis (Consumption)	30
Tabes Mesenterica (Marasmus)	6
CLASS III—Local.	
ORDER 1—*Nervous.*	
Apoplexia (Apoplexy)	2
Convulsio (Convulsions)	14
Encephalitis (Inflammation of the Brain)	3
Meningitis	8
Myelitis (Inflammation of Spinal Cord)	1
Paralysis (Palsy)	1
ORDER 2—*Circulatory.*	
Aneurisma (Aneurism)	1
Endocarditis (Inflammation of Membrane lining Heart)	1
Morbus valvularum cordis (Valvular Disease of Heart)	7
Pericarditis (Inflammation of Membrane covering Heart	1
ORDER 3—*Respiratory.*	
Apoplexia pulmonalis (Congestion of Lungs)	5
Bronchitis (Bronchitis)	18
Hydrothorax (Dropsy of Chest)	1
Laryngitis (Inflammation of Larynx)	1
Œdema glotidis	1
Pleuritis (Pleurisy)	1
Pneumonia (Inflammation of Lung)	18
ORDER 4—*Digestive.*	
Entiritis (Inflammation of Bowels)	1
Gastritis (Inflammation of Stomach)	4
Hæmatemesis (Blood-Vomit)	2
Hernia (Rupture)	1
Icterus (Jaundice)	1
Peritonitis (Inflammation of Abdomen)	7
Strictura intestini (Stricture of Intestine)	1
ORDER 5—*Urinary.*	
Cystitis (Inflammation of Bladder)	1
Nephria (Bright's Disease)	2
Nephritis (Inflammation of Kidneys)	3
ORDER 6—*Generative.*	
Metritis (Inflammation of Womb)	3
ORDER 8—*Integumentary.*	
Abscessus (Abscess)	2
Eczema	1
CLASS IV—Developmental.	
ORDER 1—*Children.*	
Dentitio (Teething)	1
Partus emortuus (Still-Birth)	16
Partus intempestivus (Premature Birth)	6
ORDER 2—*Women.*	
Eclampsia parturi (Convulsions in Childbirth)	1
Febris puerperalis (Puerperal Fever)	2
ORDER 3—*Old People.*	
Senectus (Old Age)	9
—(Senile Debility)	5
ORDER 4—*Nutrition.*	
Debilitas (Debility)	1
CLASS V—Violence.	
ORDER 1—*Accident.*	
Fractura (Fracture) of Spine	1
Submersio (Drowning)	1
ORDER 4—*Suicide.*	
Vulnera (Wounds)	1

Total (without still-births and premature births), 240; being 23,548 per thousand of population per annum.

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* Uterus, 1; not stated, 1.

MAY—Continued.

SEX.

Minors—Male	57	**Total Females**	126
Minors—Female	72	**Total Minors**	129
Adults—Male	57	**Total Adults**	111
Adults—Female	54		—
Total Males	114	**Whole number**	240

AGE.

MALES.	Sin.	M'd	W.	T'l	FEMALES.	Sin.	M'd	W.	T'l
Under 1 year	19	....	....	19	Under 1 year	34	....	...	34
From 1 to 5	26	....	....	26	From 1 to 5	21	....	....	21
From 5 to 10	5	....	....	5	From 5 to 10	8	....	....	8
From 10 to 20	7	....	....	7	From 10 to 20	9	....	....	9
From 20 to 30	10	3	..	13	From 20 to 30	1	7	1	9
From 30 to 40	4	7	...	11	From 30 to 40	....	8	....	8
From 40 to 50	2	12	....	14	From 40 to 50	2	8	....	10
From 50 to 60	....	2	1	3	From 50 to 60	2	4	....	6
From 60 to 70	....	7	3	10	From 60 to 70	....	5	2	8
From 70 to 80	....	3	....	3	From 70 to 80	....	4	2	6
Over 80	....	2	1	3	Over 80	1	6	....	7
Total Males	73	36	5	114	Total Females	78	42	6	126
					Grand total	151	78	11	240

CEMETERIES WHERE BURIED.

Elmwood	65	**Free Sons of Israel**	—	**Elsewhere**	15
Woodmere	40	**Beth El**	1	**Special burial in**	—
Mount Elliott	106	**King David's Lodge**	—		
German Lutheran	12	**Shaary Zedeck**	1	**Total**	240

NATIVITIES.

Detroit	108	**England**	6	**Russia**	—
Michigan	8	**France**	—	**Scotland**	2
Other States	18	**Germany**	43	**Sweden**	1
Austria	—	**Holland**	2	**Switzerland**	—
Belgium	1	**Hungary**	—	**Wales**	—
Bohemia	—	**Ireland**	21	**Not stated**	11
Canada	17	**Italy**	—	**In transit**	1
China	—	**Norway**	—		
Denmark	—	**Poland**	1	**Total**	240

DAILY MORTALITY.

1st	8	**12th**	5	**23d**	14
2d	12	**13th**	6	**24th**	8
3d	12	**14th**	6	**25th**	11
4th	5	**15th**	6	**26th**	4
5th	3	**16th**	8	**27th**	6
6th	12	**17th**	7	**28th**	16
7th	2	**18th**	8	**29th**	8
8th	5	**19th**	10	**30th**	5
9th	9	**20th**	10	**31st**	7
10th	6	**21st**	4		
11th	11	**22d**	6	**Total**	240

SUMMARY OF MORTALITY

FOR THE

SIX MONTHS ENDING MAY 31, 1882.

CAUSES OF DEATH.

CLASS I—Zymotic.

ORDER 1—*Miasmatic.*

Cholera Infantum	5
Cynanche trachealis (Membranous Croup)	35
Diarrhœa acuta (Acute Diarrhœa)	1
Diarrhœa chronica (Chronic Diarrhœa)	2
Dysenteria acuta (Acute Dysentery)	5
Diphtheria (Diphtheria)	90
Entero-colitis	3
Erysipelas (Erysipelas)	13
Febris biliosa (Bilious Fever)	3
Febris congestiva (Congestive Fever)	2
Febris remittens (Remittent Fever)	40
Febris typhoides (Typhoid Fever)	15
Morbilli (Measles)	15
Parotitis (Mumps)	1
Pertussis (Whooping Cough)	2
Pyæmia (Pyæmia)	6
Scarlatina (Scarlet Fever)	50
Tonsilitis (Quinsy)	2
Variola (Small-Pox)	9

ORDER 2—*Enthetic.*

Syphilis tertiara (Tertiary Syphilis)	6

ORDER 3—*Dietic.*

Alcoholismus (Alcoholism)	5
Delirium alcoholicum (Delirium Tremens)	4
Rachitis (Rickets)	1

ORDER 4—*Parasitic.*

Tænia solum (Tape Worm)	1

CLASS II—Constitutional.

ORDER 1—*Diathetic.*

Anæmia (Anæmia)	2
Anasarca (General Dropsy)	6
Arthritis (Articular Rheumatism)	1
Asthma (Spasmodic Asthma)	5
Carcinoma (Cancer)*	31
Gangræna senilis (Dry Gangrene)	1
Hydrops (Dropsy)	9
Leucocythæmia	1
Rheumatismus (Rheumatism)	10

ORDER 2—*Tubercular.*

Hydrocephalus	7
Meningitis tuberculosis (Tubercular Meningitis)	16
Peritonitis tuberculosis (Tubercular Peritonitis)	2
Phthisis pulmonalis (Consumption)	129
Tabes Mesenterica (Marasmus)	36
Other Tubercular Diseases	3

CLASS III—Local.

ORDER 1—*Nervous.*

Apoplexia (Apoplexy)	21
Convulsio (Convulsions)	90
Encephalitis (Inflammation of the Brain)	18
Epilepsia (Epilepsy)	2
Hemiplegia (Paralysis of one side of the Body)	2
Hydrocephalus acutus (Acute Hydrocephalus)	4
Insania (Insanity)	2
Meningitis	35
Myelitis (Inflammation of Spinal Cord)	1
Necrencephalus (Softening of Brain)	3
Paralysis (Palsy)	8
Paralysis agitans (Shaking Palsy)	3
Paraplegia (Palsy of Lower Extremities)	2
Tetanus (Lockjaw)	8

ORDER 2—*Circulatory.*

Aneurisma (Aneurism)	2
Atrophia cordis (Atrophy of Heart)	3
Degeneratio cordis (Fatty degenerat'n of Heart)	1
Embolismus (Embolism)	6
Endocarditis (Inflammation of Membrane lining Heart)	8
Hydrops Pericardii (Dropsy of Heart)	4
Hypertrophia cordis (Enlargement of Heart)	2
Morbus valvularum cordis (Valvular Disease of Heart)	32
Pericarditis (Inflammation of Membrane covering Heart	5
Syncope (Fainting)	1

ORDER 3—*Respiratory.*

Apoplexia pulmonalis (Congestion of Lungs)	25
Bronchitis (Bronchitis)	57
Emphysema	1
Gangrænum pulmonum (Gangrene of Lungs)	2
Hydrothorax (Dropsy of Chest)	2
Laryngitis (Inflammation of Larynx)	2
Œdema glotidis	1
Pleuritis (Pleurisy)	2
Pleuro Pneumonia (Pleurisy and Inflammation of Lungs)	6
Pneumonia (Inflammation of Lungs)	83
Pneumothorax	1
Other Diseases of the Respiratory System	1

ORDER 4—*Digestive.*

Ascites (Abdominal Dropsy)	2
Cirrhosis	2
Dyspepsia (Indigestion)	1
Entiritis (Inflammation of Bowels)	15
Gastritis (Inflammation of Stomach)	15
Hæmatemesis (Blood-Vomit)	2
Hepatitis (Inflammation of Liver)	13
Hernia (Rupture)	4
Icterus (Jaundice)	5
Intus-susceptio (Invagination of Gut)	1
Obstipatio (Constipation)	2
Peritonitis (Inflammation of Abdomen)	18
Stomatitis (Inflammation of Mouth)	6
Strictura intestina (Stricture of Intestine)	1

ORDER 5—*Urinary.*

Cystitis (Inflammation of Bladder)	1
Nephria (Bright's Disease)	11
Nephritis (Inflammation of Kidneys)	7

ORDER 6—*Generative.*

Metritis (Inflammation of Womb)	5
Tumor ovarii (Ovarian Tumor)	1
Tumor uteri (Uterine Tumor)	2

ORDER 8—*Integumentary*

Abscessus (Abscess)	3
Eczema	1

CLASS IV—Developmental.

ORDER 1—*Children.*

Cyanosis	4
Dentitio (Teething)	2
Hæmorrhagia umbilicalis (Umbilical Hæmorrhage)	2
Partus emortuus (Still-Birth)	111
Partus intempestivus (Premature Birth)	43

ORDER 2—*Women.*

Abortus (Abortion, Miscarriage)	1
Climacteria (Turn of Life)	1
Eclampsia parturi (Convulsions in Childbirth)	4

SUMMARY—Continued.

Febris puerperalis (Puerperal Fever)	11
Hæmorrhagia post partum (Flooding)	2
Phlegmasia dolens (Milk Leg)	1
Chronic Pelvic Cellulitis.	1
ORDER 3—*Old People.*	
Senectus (Old Age)	32
—— (Senile Debility)	12
ORDER 4—*Nutrition.*	
Debilitas (Debility)	38

CLASS V—Violence.	
ORDER 1—*Accident.*	
Amputatio (Amputation)	1
Concussio (Concussion of Spine)	1
Fractura (Fracture) of spine, 1; skull, 5; thigh, 1	7
Submersio (Drowning)	3
Venenatio (Poisoning) by morphine, 1; unknown, 1	2
Vulnera (Wounds)	1
Other Causes of Violent Death	6

ORDER 3—*Homicide.*	
Murder and Manslaughter	3
ORDER 4—*Suicide.*	
Suspendium (Hanging).	1
Venenatio (Poisoning) by unknown, 1; arsenic, 1; opium, 1.	3
Vulnera (Wounds)	3
Unknown	8

Total (without still-births and premature births) 1,269; being 21,166 per thousand of population per annum.

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*Uterus, 4; breast, 1; liver, 4; œsophagus, 2; thigh, 1; neck, 1; face, 1; stomach, 4; not stated, 13.

SEX.

Minors—Male	353
Minors—Female	348
Adults—Male	303
Adults—Female	265
Total Males	656
Total Females	613
Total Minors	701
Total Adults	568
Whole number	1,269

AGE.

MALES.	Sin.	M'd	W.	T'l	FEMALES.	Sin.	M'd	W.	T'l
Under 1 year	158	....	....	158	Under 1 year	161	....	....	161
From 1 to 5	124	....	....	124	From 1 to 5	96	....	....	96
From 5 to 10	39	....	....	39	From 5 to 10	43	....	....	43
From 10 to 20	32	....	....	32	From 10 to 20	43	1	....	49
From 20 to 30	55	9	....	64	From 20 to 30	19	34	1	54
From 30 to 40	15	34	1	50	From 30 to 40	4	45	1	50
From 40 to 50	8	44	....	52	From 40 to 50	4	31	2	37
From 50 to 60	....	33	3	36	From 50 to 60	2	21	3	26
From 60 to 70	1	45	3	49	From 60 to 70	....	30	13	43
From 70 to 80	1	31	5	37	From 70 to 80	1	20	14	35
Over 80	2	7	6	15	Over 80	1	12	6	19
Total Males	435	203	18	656	Total Females	379	194	40	613
					Grand total	814	397	58	1269

CEMETERIES WHERE BURIED.

Elmwood	360
Woodmere	188
Mount Elliott	561
German Lutheran	42
Free Sons of Israel	5
Beth El	3
King David's Lodge	—
Shaary Zedeck	10
Elsewhere	100
Special burial in	—
Total	1,269

NATIVITIES.

Detroit	623
Michigan	49
Other States	113
Austria	4
Belgium	2
Bohemia	3
Canada	74
England	41
France	4
Germany	157
Holland	5
Hungary	3
Ireland	83
Poland	20
Russia	3
Scotland	19
Sweden	1
Switzerland	3
Not stated	59
In transit	3
Total	1,269

METEOROLOGICAL REPORT.

Observations taken at Signal Office in Detroit, Mich., during the Month of December, 1881. Furnished for the use of the Health Department.

DECEMBER.	Barometer, Daily Mean.	Thermometer, Daily Mean.	Relative Humidity, Daily Mean.	Direction of Wind.	Velocity of Wind.			State of Weather.	Rain.
Day and Date.					6.36 a.m.	2.36 p.m.	10.36 p.m.		Inches.
Thursday......... 1	30.203	38.7	73.0	N W	20	17	8	Thre'tn'g	0.16
Friday..... 2	30.404	40.2	71.7	N E	5	1	5	Cloudy ..	....
Saturday 3	30.352	41.5	78.7	N W	1	6	5	Cloudy ..	——
Sunday........... 4	30.347	40.3	77.3	W	5	3	8	Cloudy ..	0.09
Monday........... 5	30.325	40.0	69.7	S W	8	10	14	Cloudy ..	....
Tuesday 6	29.762	47.4	75.0	S	24	14	11	Cloudy ..	0.07
Wednesday 7	29.981	34.7	73.3	N W	27	26	10	Clear.....	0.02
Thursday......... 8	30.009	40.1	67.3	S W	7	24	12	Fair	....
Friday............ 9	30.292	32.8	63.7	W	10	11	15	Clear	....
Saturday 10	30.533	31.3	79.3	W	6	7	12	Clear	....
Sunday...........11	30.332	37.4	81.0	S	7	10	6	Cloudy ..	0.04
Monday 12	30.044	48.3	79.7	S	10	15	5	Thre'tn'g	0.08
Tuesday......... 13	29.832	57.1	84.7	S	19	12	16	Sprinkl'g	1 15
Wednesday......14	30.249	35.5	70.0	N W	5	12	6	Fair	....
Thursday.........15	30.562	33·6	71.2	W	3	3	10	Clear.....	....
Friday 16	30.361	41.0	66.0	S	18	29	21	Clear.....	....
Saturday 17	30.236	45.6	68.3	S W	12	20	14	Fair	....
Sunday.......... 18	30.426	40.5	77.3	S W	8	4	3	Clear.....	....
Monday...........19	30.357	45.5	74.7	S	7	7	6	Fair	....
Tuesday..... ...20	30.359	44.0	86.3	N E	2	7	12	Foggy ...	0.08
Wednesday......21	30.158	42.7	89.0	N E	16	10	4	L't Rain.	0.33
Thursday.........22	29.822	43.2	100.0	N	2	11	28	L't Rain.	1.09
Friday 23	30.140	32.0	75.3	N	24	15	1	Clear.....	0.53
Saturday..........24	30.340	38.5	69.0	S	0	10	9	Clear.....	....
Sunday. 25	30.225	43.4	80.0	S	8	8	9	Cloudy ..	....
Monday...........26	30.096	44.7	82.7	N E	6	0	5	Thre'tn'g	——
Tuesday. 27	29.904	43.3	80.0	N	7	5	10	Cloudy ..	0.20
Wednesday......28	29.795	50.6	79.0	S	9	16	6	Cloudy ..	0.06
Thursday.........29	29.740	39.1	72.7	N W	11	14	12	Fair	0.04
Friday............30	29.681	27.1	84.3	S W	10	20	15	Cloudy ..	0.07
Saturday 31	29.760	25.0	88.0	W	15	13	9	Thre'tn'g	0.16
Sums.	934.627	1245.1	2388.3	S	312	360	307	Cloudy ..	4.17
Means............	30.149	40.2	77.0		10.1	11.6	9.9		......

—— Indicates that amount of precipitation is too small to measure.

NOTE.—The barometric readings are corrected for temperature, instrumental error and elevation above sea-level of 661 feet. By substracting from this corrected barometer 0.770", the barometer is only corrected for temperature and instrumental error; take from this 0.017", the instrumental error, leaves barometer corrected for temperature only.

SUMMARY.

Monthly mean barometer..........30.149′
Highest barometer, (15th)..........30.590′
Lowest barometer, (6th)............29.584′
Monthly range of barometer....... 1.006′
Monthly mean temperature.......40.2°
Highest temperature, (6th)... ....59.8°
Lowest temperature. (10th)........23.9°
Monthly range of temperature....35.9°
Greatest daily range of temperature, (14th).......................26.2°
Least daily range of temperature, (31st) .... 1.8°
Mean of maximum temperature...45.9°
Mean of minimum temperature...35.2°
Mean daily range of temperature..10.7°
Prevailing direction of wind.......South.

Total movement of wind, (miles).. 7732
Highest velocity and direction of wind, (7th)......42 miles per hour, west.
Number of foggy days, (22d)....... 1
Number of clear days............. 6
Number of fair days........... ... 8
Number of cloudy days............ 17
Number of days on which rain fell 18
Average depth unmelted snow on ground end of month............ 1.5″
Date of solar halos................ 0
Date of lunar halos, 8th morning and 8th evening.
Date of zodiacal light............. 0
Dates of hoar frost...9, 10, 11, 15, 18, 19, 25

METEOROLOGICAL REPORT.

Observations taken at Signal Office in Detroit, Mich., during the Month of January, 1882. Furnished for the use of the Health Department.

JANUARY.	Barometer, Daily Mean.	Thermometer, Daily Mean.	Relative Humidity, Daily Mean.	Direction of Wind.	Velocity of Wind.			State of Weather.	Rain.
Day and Date.					6·36 a.m.	2.36 p.m.	10.36 p.m.		Inches.
Sunday........... 1	30.088	22.0	78.3	N W	12	9	8	Cloudy ..	....
Monday........... 2	30.143	24.3	78.3	W	7	6	10	Fair	0.02
Tuesday.......... 3	30.338	21.2	80.3	W	12	16	6	Clear.....	0.04
Wednesday...... 4	30.586	19.8	76.0	N E	5	16	14	Cloudy ..	——
Thursday......... 5	30.421	26.3	78.7	E	10	7	5	Cloudy ..	...
Friday............ 6	30.042	35.4	78.7	S W	8	17	14	Cloudy ..	——
Saturday......... 7	30.083	41.3	79.7	S E	4	9	6	Cloudy ..	0.11
Sunday........... 8	29.814	47.2	87.0	W	15	15	12	L't Rain.	0.14
Monday 9	30.234	32.9	74.7	W	12	15	2	Cloudy ..	0.02
Tuesday..........10	30.165	35.9	80.0	N E	4	11	11	L't Rain.	0.34
Wednesday......11	30.203	34.3	76.7	W	18	13	10	Cloudy ..	0.06
Thursday 12	30.377	35.4	80.0	S	4	4	4	L't Snow.	——
Friday.............13	29.780	37.7	83.3	S W	10	14	26	L't Snow.	0.25
Saturday.... 14	29.993	26.9	79.0	W	26	16	17	Cloudy ..	0.02
Sunday............15	29.857	39.0	81.3	S W	14	6	4	Cloudy ..	——
Monday.......... 16	30.063	27.2	71.7	N W	6	14	11	Cloudy ..	——
Tuesday. 17	30.310	21.5	71.3	W	8	8	10	Fair	....
Wednesday.......18	30.104	29.2	75.3	S	14	14	7	Cloudy ..	....
Thursday 19	30.282	31.5	85.0	S E	7	6	11	Fair	——
Friday........... 20	30.091	40.5	74.3	S	10	13	6	Cloudy ..	——
Saturday 21	29.908	39.5	89.3	S W	10	8	21	L't Rain.	0.14
Sunday.............22	30.387	15.2	75.3	N W	18	23	17	Cloudy ..	....
Monday. 23	30.674	11.8	67.3	N W	7	14	5	Clear.....	0.03
Tuesday...........24	30.574	23.2	78.7	S E	8	10	8	Clear.. ..	....
Wednesday.......25	30.012	41.2	81.7	S E	8	16	20	L't Rain.	0.27
Thursday. 26	29.741	48.8	85.3	S	8	15	32	Cloudy ..	0.53
Friday 27	30.273	38.1	77.0	E	12	7	8	Cloudy ..	....
Saturday...........28	29.983	32.1	75.7	W	4	19	29	Cloudy ..	....
Sunday 29	30.360	18.5	75.0	S W	20	12	17	Clear...	....
Monday............30	30.119	31.5	69.3	S W	12	14	12	Clear.....	....
Tuesday 31	29.758	32.4	69.7	W	4	12	10	Cloudy ..	....
Sums	934.763	961.8	2413.9	S W	317	379	373	Cloudy ..	1.97
Means..	30.154	31.0	77.9		10.2	12.2	12.0		....

—— Indicates that amount of precipitation is too small to measure.

NOTE.—The barometric readings are corrected for temperature, instrumental error and elevation above sea-level of 661 feet. By subtracting from this corrected barometer, 0.760″, the barometer is only corrected for temperature and instrumental error; take from this 0.017″, the instrumental error, leaves barometer corrected for temperature only.

SUMMARY.

Monthly mean barometer..........	30.154′	Prevailing direction of wind	south-west.
Highest barometer, (23d)...........	30.782′	Total movement of wind, (miles)..	8536
Lowest barometer, (31st)...........	29.658′	Highest velocity and direction of wind. (26th).....	39 miles per hour, west.
Monthly range of barometer.......	1.124′	Number of foggy days, (26th)......	1
Monthly mean temperature........	31.0°	Number of clear days..............	3
Highest temperature, (26th)........	56.1°	Number of fair days	13
Lowest temperature, (24th)........	8.0°	Number of cloudy days............	15
Monthly range of temperature	41.8°	Number of days on which rain fell	20
Greatest daily range of temperature, (22d).......................	24.0°	Average depth unmelted snow on ground end of month............	0
Least daily range of temperature, (23d)	3.3°	Date of solar halos.................	0
Mean of maximum temperature...	36.1°	Date of lunar halos..........	27th and 30th
Mean of minimum temperature...	25.2°	Date of zodiacal light..............	0
Mean daily range of temperature..	11.3°	Dates of hoar frost.........	2, 10, 12, 16, 27

METEOROLOGICAL REPORT.

Observations taken at Signal Office in Detroit, Mich., during the Month of February, 1881. Furnished for the use of the Health Department.

FEBRUARY.	Barometer, Daily Mean.	Thermometer, Daily Mean.	Relative Humidity, Daily Mean.	Direction of Wind.	Velocity of Wind.			State of Weather.	Rain.
Day and Date.					6.36 a.m.	2.36 p.m.	10.36 p.m.		Inches.
Wednesday...... 1	29.900	39.5	67.3	S W	17	25	16	Clear....	....
Thursday......... 2	29.967	39.7	69.0	S W	8	21	13	Clear....	....
Friday........... 3	30.149	33.3	71.7	S E	6	5	11	Clear....	....
Saturday......... 4	29.750	35.3	71.7	W	5	15	9	Clear....	—
Sunday........... 5	29.882	34.3	75.0	W	4	15	14	Clear....	....
Monday.......... 6	30.147	39.4	71.0	E	4	13	8	Fair......	....
Tuesday......... 7	29 931	46.0	76.7	S	10	12	18	Clear....	0.03
Wednesday 8	30.128	38.5	65.7	S E	6	12	2	Clear....	....
Thursday......... 9	29.893	37 4	65 0	W	6	9	14	Fair.....	....
Friday............10	30.315	37.2	59.0	W	13	11	5	Clear....	....
Saturday.........11	30.335	47 6	65.0	S	12	16	22	Cloudy...	—
Sunday...........12	30.095	52.9	67.7	S	17	28	19	Cloudy...	0.04
Monday..........13	30.003	47.6	67.0	W	11	18	7	Clear.....	0.25
Tuesday........ 14	30.134	44.9	60 0	S W	6	12	8	Clear.....	....
Wednesday......15	30.082	49.7	62.7	S	8	15	10	Clear.....	....
Thursday........16	29.959	48.6	80.7	N W	9	4	18	Cloudy...	0.10
Friday............17	30.551	27.9	84.0	N	8	15	7	Cloudy...	....
Saturday.........18	30.432	35.2	74.0	E	15	15	11	Cloudy...	...
Sunday.... 19	30.084	43.7	83.7	N W	9	9	11	L't rain..	0.07
Monday..........20	29.954	35.4	75.3	N E	13	13	11	Thre'tn'g	0.28
Tuesday..........21	29.507	33.2	88.7	S W	11	31	15	L't snow.	0.53
Wednesday......22	29.993	23.4	82.7	W	24	21	13	L't snow.	0.19
Thursday.........23	30.234	26 5	78.7	W	9	10	5	Cloudy...	0.02
Friday............24	30.500	33.9	63.3	N W	8	5	2	Clear.....	—
Saturday.........25	30.413	40.3	73.0	S	3	12	8	Clear.....	....
Sunday...........26	30.179	45.2	69.3	S	8	11	3	Cloudy...	0.02
Monday...........27	30.116	48.3	67.3	E	5	12	10	Fair......	....
Tuesday..........28	29.662	53.9	73.0	S E	20	18	23	Cloudy...	0.38
Sums.......... . ..	842.295	1118.8	2008.2	W	275	403	313	Clear.....	1.91
Means	30.082	39.9	71.7		9.8	14.4	11.2		....

— Indicates that amount of precipitation is too small to measure.

NOTE.—The barometric readings are corrected for temperature, instrumental error and elevation above sea-level of 661 feet. By subtracting from this corrected barometer 0.750, the barometer is only corrected for temperature and instrumental error; take from this 0.017', the instrumental error, leaves barometer corrected for temperature only.

SUMMARY.

Monthly mean barometer..........	30.082"
Highest barometer, (17th).........	30.638"
Lowest barometer, (21st)..........	29.313"
Monthly range of barometer......	1.325"
Monthly mean temperature.......	39.9°
Highest temperature, (28th).......	57.5°
Lowest temperature, (23d)....	20.0°
Monthly range of temperature....	37.5°
Greatest daily range of temperature, (17th)......	21.1°
Least daily range of temperature (22d)..............................	5.8°
Mean of maximum temperature..	45.7°
Mean of minimum temperature...	33.2°
Mean daily range of temperature.	12.5°

Prevailing direction of wind.......	West.
Total movement of wind (miles)...	7854
Highest velocity and direction of wind (21st), southwest, 36 miles per hour	
Number of foggy days......... ...	0
Number of clear days..............	11
Number of fair days...............	9
Number of cloudy days...........	8
Number of days on which rain fell	14
Average depth of unmelted snow on ground at end of month.....	0
Date of solar halos..................	0
Date of lunar halos.................	26th
Date of zodiacal light...	0
Dates of hoar frost.......	2, 5, 6, 8, 9, 14, 15

METEOROLOGICAL REPORT.

Observations taken at Signal Office in Detroit, Mich., during the month of March, 1882. Furnished for the use of the Health Department.

MARCH.					Velocity of Wind.			State	Rain.
Day and Date.	Barometer, Daily Mean.	Thermometer, Daily Mean.	Relative Humidity, Daily Mean.	Direction of Wind.	6.36 a.m.	2.36 p.m	10.36 p.m	of Weather.	Inches.
Wednesday...... 1	29.814	53.2	68.0	N W	10	4	12	Clear....	0.09
Thursday........ 2	30.039	54.6	59.7	W	8	6	10	Clear....	...
Friday........... 3	30.257	44.7	65.7	N W	4	16	6	Clear....	...
Saturday 4	30.224	42.4	65.0	E	11	8	7	Cloudy ..	....
Sunday.......... 5	29.878	49.0	76.7	W	9	8	11	L't Rain.	0.28
Monday 6	30.098	38.2	69.0	W	9	20	16	Cloudy ..	——
Tuesday.......... 7	30.602	28.9	84.7	E	11	10	9	Cloudy ..	0.04
Wednesday...... 8	30.476	36.5	69.0	N E	11	14	8	Fair......	——
Thursday........ 9	29.734	39.2	95.3	N W	13	19	3	L't Rain.	0.81
Friday...........10	30.135	33.6	76.0	S W	20	14	9	Cloudy ..	0.07
Saturday 11	30.198	36.2	79.7	W	9	16	8	L't Snow	0.04
Sunday..........12	29.841	35.9	79.7	N W	3	19	9	L't Snow	0.12
Monday..........13	30.042	31.9	75.3	E	12	14	6	Cloudy ..	0.02
Tuesday..........14	30.263	35.2	68.7	S E	8	6	7	Cloudy ..	....
Wednesday......15	30.060	35.3	90.3	N	13	16	12	Cloudy ..	0.20
Thursday........16	30.347	34.8	76.0	E	9	4	2	Cloudy ..	....
Friday...........17	30.234	39.9	76.3	S E	9	15	19	Cloudy ..	....
Saturday........18	29.854	46.8	81.7	W	18	13	12	L't Rain.	0.93
Sunday..........19	30.176	45.2	71.0	N E	7	8	4	Clear....	...
Monday 20	29.953	42.6	69.7	W	9	15	22	Cloudy ..	0.03
Tuesday.... 21	29.682	35.1	86.0	N W	9	27	20	L't Rain.	0.34
Wednesday.......22	30.219	29.3	76.7	S W	12	20	8	Cloudy ..	0.04
Thursday........23	30.151	40.7	67.7	N W	12	27	22	Clear....	....
Friday...........24	30.338	29.3	70.7	S E	8	13	5	Cloudy ..	....
Saturday 25	30.230	37.2	66.7	S	2	15	7	Cloudy ..	0.19
Sunday..........26	29.774	55.9	64.7	N W	5	18	27	Cloudy ..	0.04
Monday..........27	29.575	45.2	70.4	S E	28	22	13	Cloudy ..	0.08
Tuesday..........28	30.031	38.5	64.3	S	7	10	6	Fair.....	....
Wednesday......29	29.777	53.6	59.0	N W	23	20	13	Clear ...	0.02
Thursday........30	30.319	38.4	60.3	S E	9	16	14	Cloudy ..	....
Friday...........31	30.418	39.1	73.0		9	6	10	Cloudy ..	——
Sums...............	932.739	1246.4	2257.0	W	327	439	337		3.34
Means...............	30.088	40.2	72.8		10.5	14.2	10.9	Cloudy ..	0.108

—— Indicates that amount of precipitation is too small to measure.

NOTE.—The barometric readings are corrected for temperature, instrumental error and elevation above sea-level of 661 feet. By subtracting from this corrected barometer 0.750, the barometer is only corrected for temperature and instrumental error; take from this 0.017", the instrumental error, leaves barometer corrected for temperature only.

SUMMARY.

Monthly mean barometer	30.099"
Highest barometer, (7th)	30.694"
Lowest barometer, (27th)	29.353"
Monthly range of barometer	1.341"
Monthly mean temperature	39.8°
Highest temperature, (26th)	63.6°
Lowest temperature, (24th)	23.1°
Monthly range of temperature	40.5°
Greatest daily range of temperature, (27th)	28.0°
Least daily range of temperature (13th)	4.5°
Mean of maximum temperature	46.0°
Mean of minimum temperature	33.3°
Mean daily range of temperature	12.7°
Prevailing direction of wind	Northwest.

Total movement of wind, (miles)	8800
Highest velocity and direction of wind (26th and 29th), south,	36 miles per hour.
Number of foggy days	0
Number of clear days	5
Number of fair days	11
Number of cloudy days	15
Number of days on which rain fell,	20
Average depth unmelted snow on ground at end of month	0
Date of solar halos	0
Date of lunar halos	28th
Date of zodiacal light	0
Dates of hoar frost,	14th and 17th

METEOROLOGICAL REPORT.

Observations taken at Signal Office in Detroit, Mich., during the month of April, 1882. Furnished for the use of the Health Department

APRIL.	Barometer, Daily Mean.	Thermometer, Daily Mean.	Relative Humidity, Daily Mean.	Direction of Wind.	Velocity of Wind.			State of Weather.	Rain.
Day and Date.					6.36 a.m.	2.36 p.m.	10.36 p.m.		Inches.
Saturday.......... 1	29.976	57.8	62.3	S W	11	12	9	Clear.. ..	....
Sunday.......... 2	30.121	53.0	71.3	N	9	17	11	Clear.....	—
Monday 3	30.223	51.5	64.7	N E	9	9	5	Clear.....	....
Tuesday.......... 4	30.101	49.9	71.3	N	8	17	13	Fair......	0.04
Wednesday...... 5	30.273	39.1	83.3	E	9	15	9	Cloudy ..	0.45
Thursday........ 6	29.962	56.8	74.7	S	9	9	13	Cloudy ..	0.02
Friday........... 7	30.121	53.2	74.3	W	14	8	10	Clear	. ..
Saturday.......... 8	30.167	46.4	77.3	N E	10	10	8	Clear.....	....
Sunday.......... 9	20.942	39.2	73.7	N	11	20	13	Cloudy ..	....
Monday .... .10	30.047	26.8	80.7	N	22	18	12	Cloudy ..	—
Tuesday..........11	30.115	28.4	73.7	N W	6	12	7	Clear.....	....
Wednesday......12	30.076	35.5	71.7	W	10	11	5	Clear.....	....
Thursday.........13	30.072	42.1	66.0	N W	7	13	4	Cloudy ..	....
Friday............14	30.132	42.6	66.3	N W	3	5	4	Cloudy ..	....
Saturday..........15	39.157	45.5	66.0	S	1	7	7	Clear.....	....
Sunday...........16	30.209	47.8	45.7	W	7	10	11	Clear.....	....
Monday 17	30.212	53.5	49.3	W	6	11	5	Clear	....
Tuesday..........18	29.977	56.1	55.7	S E	6	16	15	Thre'tn'g	....
Wednesday......19	29.356	53.5	74.0	S	13	21	21	L't Rain.	0.40
Thursday.........20	29.667	40.8	73.0	W	20	21	13	Cloudy ..	0.04
Friday............21	30.032	45.8	58.0	W	9	10	6	Clear.....	...
Saturday.........22	30.051	45.3	62.0	N E	9	11	12	Cloudy ..	....
Sunday......... .23	30.039	40.7	47.3	N E	25	14	14	Clear.....	....
Monday..........24	30.277	41.9	55.3	N	8	17	8	Clear.....	....
Tuesday..........25	30.234	44.1	54.3	N E	6	12	6	Clear.....	....
Wednesday......26	30.021	44.4	62.0	N E	7	11	10	Cloudy ..	....
Thursday..... ...27	30.001	51.2	50.0	N W	6	13	12	Fair	—
Friday 28	30.016	51.0	63.0	N W	12	16	6	Fair	0.18
Saturday 29	30.109	48.2	56.7	N W	3	8	2	Clear.....	....
Sunday...........30	30.076	39.0	58.3	N E	10	7	9	Fair	—
Sums..............	901.762	1377.5	1941.9	N E	286	381	280		1.13
Means..............	36.059	45.9	64.7		9.5	12.7	9.3	Clear.....	0.038

—— Indicates that amount of precipitation is too small to measure.

NOTE.—The barometric readings are corrected for temperature, instrumental error and elevation above sea-level of 661 feet. By subtracting from this corrected barometer 0.730, the barometer is only corrected for temperature and instrumental error; take from this 0.017", the instrumental error, leaves barometer corrected for temperature only.

SUMMARY.

Monthly mean barometer	30.069"
Highest barometer, (3d)..........	30.361"
Lowest barometer, (19th..........	29.239"
Monthly range of barometer......	1.122"
Monthly mean temperature.......	45.9°
Highest temperature, (4th)........	71.0°
Lowest temperature, (11th)........	24.3°
Monthly range of temperature....	46.7°
Greatest daily range of temperature. (6th)........................	33.0°
Least daily range of temperature, (20th)............................	3.0°
Mean of maximum temperature..	54.0°
Mean of minimum temperature...	37.9°
Mean daily range of temperature.	16.1°
Prevailing direction of wind........	West

Total movement of wind, (miles)..	8072
Highest velocity and direction of wind, (19th, 20th, 23d) southwest, northeast......... ...	32 miles per hour.
Number of foggy days	0
Number of clear days.	14
Number of fair days...............	6
Number of cloudy days............	10
Number of days on which rain fell	10
Average depth unmelted snow on ground at end of month........	0
Date of solar halos.......	0
Date of lunar halos...............	0
Date of zodiacal light.............	0
Date of hoar frost........	3d, 24th and 25th
Aurora borealis.............	16th and 17th

METEOROLOGICAL REPORT.

Observations taken at Signal Office in Detroit, Mich., during the Month of May, 1882. Furnished for the use of the Health Department.

MAY.	Barometer, Daily Mean.	Thermometer, Daily Mean.	Relative Humidity, Daily Mean.	Direction of Wind.	Velocity of Wind.			State of Weather.	Rain.
Day and Date.					6.36 a.m.	2.36 p.m.	10.36 p.m.		Inches.
Monday.. 1	29.994	48.5	69.0	S W	14	21	10	Cloudy...	0.12
Tuesday.......... 2	30.292	41.8	47.7	N W	11	9	5	Clear.....	....
Wednesday...... 3	30.131	55.4	53.7	S	7	19	9	Clear.....	....
Thursday......... 4	29.847	55.0	78.3	S	5	3	12	Cloudy ..	0.02
Friday............ 5	29.939	45.4	56.3	N E	11	21	13	Cloudy ..	0.01
Saturday.......... 6	30 097	47.5	45.3	N E	18	17	18	Cloudy...	....
Sunday 7	30.205	53.6	56.3	E	14	17	8	Clear.....	....
Monday........... 8	30.000	57.3	81.0	E	10	6	4	Cloudy...	0.07
Tuesday........... 9	29.891	61.8	86.0	S E	2	5	5	Foggy....	——
Wednesday......10	29.672	52.5	95.3	N E	5	18	19	L't Rain..	0.55
Thursday.........11	29.744	47.4	90.0	N E	8	14	16	Cloudy...	0.06
Friday.............12	29.779	46.0	90.7	N E	19	21	16	L't Rain..	0.99
Saturday.........13	29.791	46.0	89.7	N E	17	15	13	L't Rain..	0.08
Sunday...........14	29.815	49.4	50.7	N	14	25	15	Fair.	0.07
Monday...........15	30.044	44.4	54.7	N E	18	14	6	Clear.....	....
Tuesday..........16	30.188	52.1	53.0	E	5	7	5	Clear.....	....
Wednesday.......17	30.255	55.9	48.0	N	10	16	5	Clear.....	....
Thursday... ..18	30.338	54.7	56.0	E	9	7	3	Clear.....	....
Friday.. 19	30.184	57.3	60.0	E	7	5	4	Clear.....	....
Saturday.........20	30.001	60.6	61.0	E	7	8	4	Clear.....	....
Sunday...........21	29.911	62.5	71.0	W	7	14	9	Thre'tn'g	0.08
Monday 22	30.065	49.1	83.0	W	9	9	7	Cloudy ..	0.22
Tuesday..........23	30.187	48.0	61.3	W	6	16	8	Cloudy ..	....
Wednesday.......24	30.185	52.2	55.0	S W	5	11	4	Clear.....	....
Thursday.........25	30.076	56.5	49.7	S W	9	9	7	Clear.....	0.02
Friday............26	29.955	63.2	55.0	S	7	10	5	Clear.....	....
Saturday 27	29.810	54.8	86.0	N E	10	19	11	L't Rain.	1.68
Sunday...........28	29.875	50.5	79.3	N	9	19	9	Clearing.	0.15
Monday...........29	30.034	56.1	53.7	N W	9	7	6	Clear.....	....
Tuesday..........30	29 892	63.6	59.7	S	7	16	5	Clear.....	....
Wednesday......31	29.556	60 7	78.0	S W	20	16	20	L't Rain..	0.52
Sums............	929.753	1649.8	2054.4	N E	309	414	281	Clear.....	4.82
Means............	29.992	53.2	66.3		10	13	9		0.155

—— Indicates that amount of precipitation is too small to measure.

Note.—The barometric readings are corrected for temperature, instrumental error and elevation above sea level of 661 feet. By subtracting from this corrected barometer 0.700, the barometer is only corrected for temperature and instrumental error; take from this 0.017″, the instrumental error, leaves barometer corrected for temperature only.

SUMMARY.

Monthly mean barometer..... ...	29.992″
Highest Barometer, (18th)..........	30.384″
Lowest barometer, (31st).........	.29.516″
Monthly range of barometer......	0.868″
Monthly mean temperature........	53.2°
Highest temperature, (26th).......	70.5°
Lowest temperature (2d)..........	32.7°
Monthly range of temperature....	37.8°
Greatest daily range of temperature, (6th)......................	25.6°
Least daily range of temperature, (11th)...........................	3.4°
Mean of maximum temperature..	60.2°
Mean of minimum temperature...	45.4°
Mean daily range of temperature.	14.8
Prevailing direction of wind..	north-east.

Total movement of wind (miles)..	7931
Highest velocity and direction of wind, (12th and 14th), 30 miles per hour............	east and north.
Number of foggy days.	0
Number of clear days.............	12
Number of fair days..............	9
Number of cloudy days	10
Number of days on which rain fell	16
Average depth unmelted snow on ground end of month...........	0
Date of solar halos	0
Date of lunar halos...............	6th
Date of zodiacal light......... .. .	0
Dates of hoar frost......	2, 3, 16, 23, 24, 29
Aurora borealis..................	0

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